

GRANDE RONDE BASIN ENDEMIC SPRING CHINOOK SALMON SUPPLEMENTATION PROGRAM PRELIMINARY ENVIRONMENTAL ASSESSMENT

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Action: Finding of No Significant Impact (FONSI) and Floodplain Statement of Findings.

Summary: Bonneville Power Administration (BPA) proposes to fund a program designed to prevent the extinction and begin the recovery of spring chinook salmon stocks in the Grande Ronde River Basin in the Upper Grande Ronde River, Lostine River, and Catherine Creek in northeastern Oregon. These stocks

comprise part of the population of Snake River spring/summer chinook salmon listed under the Endangered Species Act (ESA) by the National Marine Fisheries Service (NMFS) in 1992 as threatened. This proposed program, the Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program, would be funded by BPA and implemented in cooperation with the Oregon Department of Fish and Wildlife (ODFW), the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation.

For Additional Copies: For copies of this FONSI, please call BPA's toll-free document request line: 800-622-4520.

For Further Information, Contact: Ken Kirkman - EWN-4, Bonneville Power Administration, P.O. Box 3621, Portland, Oregon 97208-3621, phone number 503-230-5557, fax number 503-230-4564.

Supplementary Information: Under the provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980, BPA protects, mitigates, and enhances fish and wildlife and their habitats affected by the construction and operation of the Federal hydroelectric system in the Columbia River Basin. This is accomplished through funding of measures that are consistent with the Northwest Power Planning Council's (Council) Fish and Wildlife Program and other purposes of the Act [16 U.S. 839b(h)(10)(A)]. The site-specific fish and wildlife mitigation projects that BPA funds are intended to help reach the Council's mitigation goals and are "in addition to, not in lieu of, other expenditures authorized or required from other entities under other agreements or provisions of law." Under the ESA, BPA also has an obligation to avoid jeopardizing the existence of a listed species and will use its authorities to conserve listed species (16 U.S.C. 1531, 1536).

The Proposed Action is for BPA to fund the efforts to prevent the extinction and begin the recovery of spring chinook salmon stocks in the Grande Ronde River Basin in the Upper Grande Ronde River, Lostine River, and Catherine Creek in northeastern Oregon. Funding would allow:

- hatchery spawning and rearing of the fish and their release into the Upper Grande Ronde, Lostine River, and Catherine Creek tributaries;
- purchase of equipment and upgrades to facilities for the purpose of capturing adults, rearing, acclimation, and release of the smolts into the three tributaries; and
- a comprehensive monitoring and evaluation program.

As part of the Council's Fish and Wildlife Program, the Northeast Oregon Hatchery Program (NEOH) was the initial planning effort by the fishery co-managers to recover anadromous fish runs in Northeast Oregon. Part of NEOH planning was an effort to recover spring chinook into the Grande Ronde Subbasin. After a time, this project evolved into one of the 15 high-priority supplementation projects approved by the Council in March 1996. This project is also consistent with the Draft Recovery Plan for Snake River Salmon (NMFS, 1995), which includes the Grande Ronde Basin spring chinook salmon within its scope.

To fully achieve the Proposed Action in the Environmental Assessment (EA) prepared in February 1998, one adult collection facility and one acclimation facility would be constructed along each of the three tributaries of the Grande Ronde. In addition, the Manchester Hatchery (in Puget Sound near Bremerton, Washington) and the Bonneville Hatchery (at Bonneville Dam) are currently being upgraded to accommodate additional facilities that could be used to implement the proposed Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program.

The use of the supplementation program raises several potential environmental concerns, such as genetic hazards, exposure to disease, and the potential negative interactions between hatchery and wild fish. Four types of genetic hazards may be associated with any supplementation program: extinction, loss of within-population variability (genetic variation), domestication, and loss of population identity. However, only the first three pose a risk with the project because it does not propose use of an introduced stock.

If successful, the Proposed Action would reduce the risk of extinction of the Upper Grande Ronde Spring Chinook. The species is currently listed as threatened under the ESA; however, implementing the Captive Broodstock portion of the supplementation program may stabilize the run until it is strong enough to implement the conventional supplementation portion. Taking the no-action alternative risks extinction of the species in the Upper Grande Ronde River Basin because the population declines have been similar to the declines in the Snake River runs (ODFW, 1996). In 1997, only 19 spring chinook salmon redds were observed in the Upper Grande Ronde River, along with 46 redds in Catherine Creek and 49 redds in the Lostine River.

Genetic variability impacts would have the potential for a low negative effect, because the supplementation program would take broodstock that temporally and geographically represent the wild spawning run. These impacts are not as prominent as the risk of extinction. The proposed supplementation program would have a positive impact on overall genetic variation in the Upper Grande River Basin because it would maintain the population's genetic variability until natural recruitment is strong enough to sustain itself.

The impacts of hatchery practices on the population, either selection of broodstock, or mating and rearing practices, can lead to artificial selection for certain characteristics (domestication). However, this potential impact would not be significant because hatchery operating plans and genetic management plans for the captive broodstock and conventional supplementation aspects of the program will be in existence in order to minimize the risks of domestication. For example, in

order to reduce genetic risk, the Integrated Hatchery Operations Team-recommended hatchery techniques will be used when handling fish in the hatcheries. Conventional supplementation or natural spawning will eventually supplant captive broodstock when the results of the monitoring and evaluation and consultation with the NMFS indicate that the risk of extinction is sufficiently lowered.

The potential for disease impacts on the spring chinook population from implementing the proposed action would not be significant. The salmon supplementation program would employ fish culture practices, policies, and procedures developed for anadromous salmonid hatcheries. A draft monitoring plan has been submitted to NMFS, designed to reduce the risk of fish disease being transmitted within captive broodstocks or being transmitted to naturally produced stocks. The plan includes the most recent disease-control protocols, including low rearing densities, daily observation, and, when necessary, removal of individuals to prevent the spread of disease both within the group and ultimately to naturally produced stocks. BPA will adopt all changes to the monitoring plan recommended by NMFS.

Predation by introduced fish on native spring chinook salmon or other fish is likely to be minor. Fish size plays a major role in fish predation, as small fish are unlikely to be predatory on other fish unless the size difference is large. Juvenile spring chinook salmon in streams feed primarily on insects. Their small size precludes the possibility of predation on all but the smallest fish, and juvenile spring chinook salmon rarely consume fish while in freshwater. Because of their small size and preference for insects, incidental predation by juvenile spring chinook salmon on resident or other anadromous stocks would not be significant.

Overall, the proposal would not have a significant effect, either direct or indirect, on inter-specific competition in the Upper Grande Ronde River Basin. Because the fish released will be of hatchery origin, their migration rate is expected to be more similar to that of other hatchery fish than to naturally produced fish in the Grande Ronde Basin. The migration rate is therefore likely to be similar to spring chinook salmon from the Lookingglass Hatchery, which rapidly migrate out of the system, typically arriving at Lower Granite Dam in about 14 to 21 days. While the large number of spring chinook released may cause some reduction of local headwater stream food sources, the rapid migration of these fish would result in only minor effects to naturally produced spring chinook salmon and other fish species because of their short period of residence in the stream. Therefore, the introduction of released smolts would be a short-term effect, but would not constitute an abnormally competitive situation over the long term.

Potential environmental impacts resulting from the facility upgrades at the Manchester Hatchery (in Puget Sound near Bremerton, Washington) and the Bonneville Hatchery (at Bonneville Dam) would not be significant because all work would be done within the confines of the existing hatchery properties. No new property would be acquired, so land uses would not change. The ground has already been disturbed at each site, so any excavation required is unlikely to uncover cultural resources. In the unlikely event that cultural materials are uncovered during construction, work in the immediate vicinity of the project would stop, the ODFW would consult with the State Historic Preservation Officer and a qualified archaeologist BPA, the tribes, and the hatchery managers will ensure that any human remains encountered are treated in accordance with applicable laws.

As discussed in the paragraphs below, potential environmental impacts resulting from the construction of the adult collection and juvenile acclimation sites would not be significant. All of the proposed sites would involve construction activities on the banks and within the channels of the three target streams; however, impacts to water quality would not be significant for the reasons given below. Disturbance of the soils could cause minor wind or water erosion and sedimentation, but this would be short lived as the soils have low potential for erosion, and would be mitigated through the use of best management practices. The construction would affect very little aquatic habitat along the banks because the only structures located on the stream banks would be 8- to

30-inch-diameter water intake and discharge/fish release pipes. Thus, bank erosion and aquatic habitat modification are not concerns. The flow diversion through pipes for the juvenile acclimation and release facilities would cause an increase in water velocity at the pipe outlet. This could locally scour small areas of the streambed or stream banks. However, this would likely have a minimal impact due to the small discharge flow (maximum of 8,494 liters/minute or 5 cubic feet per second) through the outlet pipes.

Project facility construction and operation impacts to fish would be minimized through best management practices (see the EA, p. 42, Construction Effects) and design of the facilities to minimize risks to migrating fish. Impacts to vegetation and wildlife would not be significant because the amount of habitat to be removed is small (approximate total of 1.9 hectare (4.9 acres) for the six sites), and the construction and operation periods would be short (about 2 months per year). No threatened or endangered species would be adversely affected, as concluded in the Biological Assessment/Biological Evaluation submitted to the U.S. Fish and Wildlife Service and the NMFS. While these two agencies have not yet concurred with this finding, BPA is committed to any adhering to any conditions required by these agencies in order for us to reach concurrence.

Impacts to land use would not be significant. The proposed uses are compatible with existing uses at most of the sites, and no existing uses would be displaced. The seasonal use of temporary on-site housing would be a permitted or conditional land use, depending on county zoning provisions. The two sites on the Upper Grande Ronde River are located on lands within the Wallowa-Whitman National Forest and are administered by the U.S. Forest Service. The Forest Service will be issuing their own decision notice based on this EA on whether or not to amend the Wallowa-Whitman National Forest Land and Management Resource Plan and issue a special use permit. There would be minimal long-term effects on dispersed recreation and aesthetics, but these would be mitigated through design of the facilities in consultation with the U.S. Forest Service.

No significant negative impacts to cultural resources are anticipated. The sites have been surveyed and no sites or materials of archaeological significance were found. Therefore the construction or operation would not likely affect any cultural or historic sites. During construction, however, if sites are found, efforts will be stopped in the affected area, and the State Historic Preservation Office and tribal representatives would be notified. If impacts to a significant cultural site cannot be avoided, BPA would consult with the State Historic Preservation Office and tribes and prepare a historic property management plan for the site.

Monitoring and evaluation (M&E) activities would have a positive effect on the health and survival of the spring chinook. The activities are necessary and appropriate to evaluate the success of the proposed action and would not result in significant mortality or permanent adverse effects on the population. The proposed M&E component of the program is outlined in the draft long-term management plan for the Grande Ronde Basin. This plan is a condition of the ESA Section 10 permit already granted to the project proponents. All provisions of this plan, as it is finalized after consultation with NMFS, will be incorporated into the proposed program. The plan includes five primary parts:

1) a benefit/risk analysis of proposed actions; 2) a genetic management plan; 3) an adult collection plan; 4) a juvenile release plan; and 5) a M&E program to assess all phases of the Proposed Action Alternative. The information collected from the M&E aspects of the proposed program would be used to determine if the established performance criteria are being met.

Although the proposed action may be related to actions being addressed under the Impacts of Artificial Salmon and Steelhead Production Strategies in the Columbia River Basin Draft Environmental Impact Statement (EIS), it is not precluded by 40 C.F.R. 1506.1 or 10 C.F.R. 1021.211 because it is not a major Federal action and would not significantly affect the quality of the human environment. As discussed in Section 3.8 of the EA, the actions proposed are independent of the actions proposed under the Draft EIS and would not prejudice the ultimate decision on the program, as they are low-cost, low-tech, minimal-impact actions to be taken to address immediate concerns of extinction and recovery of the Grande Ronde spring chinook stocks. The information gathered from these actions, especially the monitoring and evaluation program, will be used to answer specific questions regarding the potential impacts of and viability of a supplementation/captive broodstock program for endangered or threatened salmonids.

Besides construction and operation activities occurring in the floodplains (addressed below), approximately 0.2 acres of palustrine-emergent wetlands were found on the three juvenile acclimation sites. Due to their very small size and the ability to avoid or minimize effects on them, no significant loss or disturbance is anticipated.

Floodplain Statement of Findings: This is a Floodplain Statement of Findings prepared in accordance with 10 C.F.R. Part 1022. A floodplain and wetlands assessment was incorporated in Section 6, Appendix A, of the EA. BPA proposes to fund the construction of adult collection and juvenile acclimation facilities in the floodplains of Catherine Creek, the Upper Grande Ronde River, and the Lostine River. The proposed facilities are to be located in the floodplain due to the biological needs of the fish. The only alternative to the proposed action that would not impact floodplains is the No Action Alternative. The proposed action conforms to applicable State or local floodplain protection standards. The steps to be taken to avoid or minimize potential harm to or within the affected floodplain are outlined in Section 6.0 of Appendix A of the EA.

BPA will endeavor to allow 15 days of public review after publication of this statement of findings before implementing the proposed action.

Determination: BPA has prepared an Environmental Assessment (DOE/EA 3018) evaluating the proposed project. Based on the analysis in the EA, BPA has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*). Therefore, the preparation of an Environmental Impact Statement is not required and BPA is issuing this FONSI.

Issued in Portland, Oregon, on April 9, 1998.

/s/ Alexandra B. Smith

Alexandra B. Smith

Vice President

Environment, Fish and Wildlife Group

Official File - ECN (EQ-13-5)

ERRATA SHEET FOR

GRANDE RONDE BASIN ENDEMIC SPRING CHINOOK SALMON SUPPLEMENTATION PROGRAM

FINAL ENVIRONMENTAL ASSESSMENT

DOE/EA-1173

April 3, 1998

This errata sheet documents the changes to be incorporated into the Preliminary EA named above. With the addition of these changes, the Preliminary EA will not be reprinted and will serve as the Final EA.

1. Section 1, page 3 -- add to the end of Section 1.1.3:

"The Forest Service of the Wallowa-Whitman National Forest will need to make a decision on the two sites along the Upper Grande Ronde: 1) the adult collection weir and 2) the acclimation site. The decision to be made is whether or not to allowing implementation of the proposed action which would require an amendment to the Wallowa-Whitman National Forest Land and Management Resource Plan."

2. Section 1, page 3 -- revise the second bullet in Section 1.2 to read: "Section 2 fully describes the proposed action and explains each alternative in detail."

3. Section 2, page 7 -- add at the end of the description of the Proposed Action Alternative: "We anticipate that this project would continue for a period of at least five years. Monitoring and evaluation results will determine the ultimate length of the project."

4. Section 2, page 10 -- change second sentence in Section 2.1.1, first paragraph, to read: "Copies of the final designs for the facilities are available from BPA upon request."

5. Section 2, page 14 -- Adult Collection Sites, Upper Grande Ronde River section, third paragraph, fourth line down, change to read: "...construction and operation traffic, but a short spur (120 m (400ft.)) from the campground..."

6. Section 2, page 19 -- Juvenile Acclimation and Release Sites, Upper Grande Ronde River section, first paragraph, sixth line down, change to read: " ...used as a dispersed campground, although there is limited..."

7. Section 2, page 23 -- add at the end of the last sentence in the Monitoring and Evaluation section: "Annual reports documenting the results of the monitoring and evaluation efforts will be submitted to BPA and NMFS by ODFW and the tribes. These reports will be made available to the public upon request."

8. Section 3, page 62 -- change the first sentence under 3.5.2 Potential Impacts of Proposed Action Alternative, Upper Grande Ronde River section to read: "The proposed adult collection facility would not be compatible with the current land use at the site. The site is currently identified as a Management Area 3, Wildlife-Timber Emphasis. The site needs to be changed to Management Area 16, Administrative Site, in accordance with the Wallowa-Whitman National Forest Land and Resource Management Plan. As part of the implementation portion of the proposed action, the Wallowa-Whitman National Forest would make this change."

9. Section 3, page 63 -- add a sentence at the end of the first partial paragraph to state, "The facilities would be designed to conform to the visual quality objective of retention (no change in overall visual quality from that which currently exists). Examples of such design considerations include painting the concrete an earth tone to blend in with the surroundings, and the planting of vegetation to make the facilities less visible."

10. Section 3, page 63 -- change the second sentence in the first full paragraph to read, "This site is also located within the Wallowa-Whitman National Forest boundary and would need to be changed from a Management Area 3 to an Area 16 under the Forest Plan. It would also not be regulated by county zoning ordinances."

11. Section 3, page 63 -- add a sentence at the end of the first full paragraph to read, "This site would also be designed to conform to the visual quality objective of retention."

12. Appendix A, page A-8, Section 10.0 Public Lands -- change the third and fourth sentences to read, "The development of these sites would require a change in the Wallowa-Whitman National Forest Land and Resource Management Plan and acquisition of a Special Use Permit. Information or investigations required for this Forest Plan change and the permit include..."

13. Appendix A, page A-8, Section 10.0 Public Lands -- add a sentence at the end of the fourth sentence to read, "The Forest Service will prepare a Decision Notice, based on this EA, for the change to the Forest Plan and the issuance of the special use permit."

SECTION 1: PURPOSE OF AND NEED FOR ACTION

1.1 Underlying Need for Action

As part of its responsibilities under the Northwest Power Act (Pacific Northwest Electric Power Planning and Conservation Act of 1980), Bonneville Power Administration (BPA) must **mitigate** the loss of fish, wildlife, and related spawning grounds and habitat attributable to power production at federal hydroelectric dams on the Columbia River and its tributaries. The federal dams have been identified as a major source of mortality for the listed Snake River salmon stocks.

BPA also has responsibilities under the Endangered Species Act (ESA) of 1973 to operate in a way that does not jeopardize the continued existence of listed **species** and to use its agency resources to conserve listed species. In addition, for programs such as the one being proposed, BPA and U.S. Department of Energy (USDOE) policies direct BPA to consult with Native American Tribes and to conduct activities in accordance with federal trust responsibilities to the tribes.

Federal, state, and tribal fisheries managers have determined that severely declining numbers of spring chinook salmon returning to the Grande Ronde Basin in northeast Oregon constitute an emergency situation. These managers (i.e., National Marine Fisheries Service [NMFS], Oregon Department of Fish and Wildlife [ODFW], Nez Perce Tribe [NPT], and Confederated Tribes of the Umatilla Indian Reservation [CTUIR]) consider an **endemic** spring chinook salmon (*Oncorhynchus tshawytscha*) **supplementation** program to be an important strategy needed to prevent the extinction of this stock and begin its rebuilding. In addition, the Draft Recovery Plan for Snake River Salmon (NMFS, 1995a), which includes the Grande Ronde Basin spring chinook salmon within its scope, identified the development of a Snake River spring/summer chinook salmon supplementation program as an action needed to promote the recovery of the species. Therefore, BPA is proposing to fund these programs to fulfill the need to prevent the extinction and begin the recovery of spring chinook salmon in the Grande Ronde Basin.

1.1.1 Purpose

Consistent with the related actions and processes (Section 1.1.3), BPA and its partners in the project—the ODFW, NPT, and CTUIR—want to achieve the following purposes through the implementation of the proposed program:

- Maintain consistency with the Northwest Power Planning Council's (NPPC) Fish and Wildlife Program and NMFS's Draft Recovery Plan for Snake River Salmon.
- Enhance **natural production** of spring chinook salmon in the Grande Ronde Basin and increase the probability of survival for the remaining native **populations** through the use of a locally-adapted broodstock.
- Maintain the **genetic** attributes and life history characteristics of the naturally-spawning spring chinook salmon populations in the Grande Ronde Basin on a tributary-specific basis.
- Promote the protection and maintenance of tribal treaty rights.
- Utilize new knowledge on the use of **captive broodstock** as a means to assist the recovery of endangered species. Facilitate monitoring and evaluation of the stocks health and of the projects effectiveness by developing new knowledge on the use of artificial propagation for recovery.
- Provide for administrative efficiency and cost-effectiveness.
- Protect other species and environmental resources.

1.1.2 Historical Perspective

In the late 1800s, the naturally-produced population of Snake River spring/summer chinook salmon was estimated at more than 1.5 million adult fish (NMFS, 1995a). NMFS (1995a) estimates the Snake River **threshold escapement level** for natural spring/summer chinook salmon is 11,000 to 22,000 adults per year. The **recovery escapement level** is estimated at 31,400 per year (NMFS, 1995a). The estimated total adult natural spring/summer chinook returns to the Snake River (as measured by counts at Lower Granite Dam) were only 1,721 in 1994 and 1,116 in 1995 (Washington Department of Fisheries and Wildlife [WDFW] and ODFW, 1996). The preliminary estimate for 1997 was somewhat higher at 3,487 (Norman, 1998), but this figure is still lower than the threshold escapement or recovery escapement levels. Due to the recent low numbers of adult returns, Snake River spring/summer chinook salmon were listed as threatened by NMFS in 1992.

The Grande Ronde Basin historically supported large **runs** of **naturally-produced** chinook salmon, but population declines in the basin have been similar to declines in the Snake River runs (ODFW, 1996). Specifically, the Upper Grande Ronde River, Catherine Creek, and the Lostine River were three of the most productive spawning and **rearing** areas in the Grande Ronde Basin. In 1994, only 3 spring chinook salmon **redds** were observed in the Upper Grande Ronde River, along with 11 redds in Catherine Creek and 16 redds in the Lostine River. Redd counts for these areas in 1997 were 19, 46, and 49 redds, respectively. By contrast, the corresponding estimates of redd numbers in 1957 were 478 in the Upper Grande Ronde River, 374 in Catherine Creek, and 893 in the Lostine River (ODFW, 1996).

1.1.3 Related Actions and Processes

Other activities to reverse the decline of endemic spring chinook salmon in the Grande Ronde Basin have been initiated as part of past or ongoing projects. For example, spring chinook salmon juveniles, referred to as **parr**, have been captured for broodstock by ODFW from the Upper Grande Ronde River, Catherine Creek, and the Lostine River since 1995. This activity required a Section 10 ESA permit, which was issued on August 7, 1995 (Permit No. 973). An application for a subsequent permit was prepared by ODFW (Carmichael, 1996). This application included an evaluation of the potential effects of this activity on the listed spring chinook salmon. The permit application was approved by NMFS on August 14, 1996 (Permit No. 1,011).

In 1997, sufficient adult spring chinook salmon were available for collection and initiation of conventional supplementation. As a result, a modification to Permit

No. 1,011 was requested to allow the collection of naturally-produced adult spring chinook salmon from each stream. This modification was approved on June 20, 1997 (Diaz-Soltero, 1997). Therefore, collection of both adults and juveniles has been addressed under previous Section 10 ESA permits and applications.

The Manchester Hatchery (in Puget Sound near Bremerton, Washington) and the Bonneville Hatchery (at Bonneville Dam) are currently being upgraded to accommodate additional facilities that could be used to implement the proposed Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program. NMFS manages the Manchester Hatchery and ODFW manages the Bonneville Hatchery. BPA funding for the additional facilities was addressed in a Categorical Exclusion Environmental Analysis dated July 8, 1996. These facilities are therefore not discussed in this Preliminary Environmental Assessment (EA).

Additional tanks have already been added at the Lookingglass Fish Hatchery that could accommodate any fish from the proposed supplementation program. Because the new tanks were installed at the existing developed hatchery complex, they are not addressed in detail by this Preliminary EA.

1.2 Organization of This Document

This Preliminary EA is organized as follows:

- Section 1 defines the need, purposes, and historical context of the proposed program;
- Section 2 describes the program and explains each alternative in detail;
- Section 3 discusses the existing environment at the proposed sites and provides analysis of the environmental consequences of the Proposed Action Alternative and the No Action AlternativeNo Action alternative;
- Section 4 provides a list of the agencies and organizations consulted during this process;
- Section 5 is a list of references cited throughout this document; and
- Section 6 is a glossary of terms and a list of acronyms and abbreviations.
- Appendix A provides information on the environmental consultation, review, and permit requirements under the Proposed Action Alternative.

SECTION 2: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

BPA proposes to fund a program designed to prevent the extinction and begin the rebuilding of spring chinook salmon stocks in the Grande Ronde River Basin in the Upper Grande Ronde River, Lostine River, and Catherine Creek in northeastern Oregon. These stocks comprise part of the population of Snake River spring/summer chinook salmon listed under ESA by NMFS in 1992 as threatened. This proposed program, the Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program, would be funded by BPA and implemented in cooperation with ODFW, NPT, and CTUIR.

The proposed program includes the following two components to facilitate supplementation of endemic spring chinook salmon stocks in the Grande Ronde River Basin (see Figure 1):

Captive Broodstock: This component refers to salmon or other fish kept in captivity for at least a full life cycle. It involves the collection of juvenile fish from the wild in order to rear them to adulthood, spawn them in captivity, and then release their progeny. The offspring of adults from the conventional supplementation component could also be used as captive broodstock.

The progeny of the adults reared as captive broodstock would be raised in a hatchery to the **smolt** stage. When they are almost ready to migrate to the ocean, most would be transferred to **acclimation** facilities located adjacent to release sites. They would be kept in these natural production areas for up to 2 months for rearing and **imprinting**. The smolts would then be released to migrate downstream to the ocean. Some smolts could be retained at the hatchery to perpetuate the captive broodstock component of the program.

Conventional Supplementation: This component of the program includes the capture and artificial spawning of adults, followed by incubation of the eggs and the rearing of the young in a hatchery. Similar to the captive broodstock approach, fish would be transferred to acclimation facilities for short-term rearing and then released to a stream for migration to the ocean. Some may also be retained as captive broodstock. Fisheries co-managers (ODFW, CTUIR, and NPT) will establish criteria for management of collection of adults for conventional supplementation.

Other potential options could be used with either conventional supplementation or captive broodstock. For example, in years where there are surpluses of any given life stage (e.g., eggs or **fry**), the surpluses could be released into the streams. Overall, flexibility will be incorporated into both the conventional and captive broodstock components to take advantage of changing conditions, such as number of adults returning and survival of offspring.

Figure 1. Captive Broodstock and Conventional Supplementation as Compared to Natural Production

Under the Proposed Action Alternative, BPA would provide the additional funding needed to continue the activities initiated in 1995 to conserve and rebuild spring chinook salmon stocks in the Grande Ronde Basin. The proposed program includes collection approaches similar to past or ongoing activities, but it also includes more effective and efficient collection facilities, as well as facilities for acclimation. The program also funds the development of other structures (e.g., short access roads and areas for temporary housing of on-site personnel).

This Preliminary EA evaluates the following two project alternatives:

Proposed Action Alternative: BPA would fund the construction, operation, and maintenance of facilities needed to implement a supplementation program for endemic Grande Ronde Basin spring chinook salmon (see Figure 2). Funding would also include the monitoring and evaluation of the program's effect on returning adult populations on the Upper Grande Ronde River, Catherine Creek, and the Lostine River.

The No Action Alternative: Monitoring and evaluation studies of spring chinook salmon distribution and survival resulting from natural production would continue, but with no further human intervention beyond that required to conduct such studies.

2.1 Proposed Action Alternative

The Proposed Action Alternative consists of two main components (see Figure 1). These components, as well as the monitoring and evaluation aspect of the

Proposed Action Alternative, are described below:

Captive Broodstock: This component of the program will be relied upon most heavily during the initial 5 years of the program when run numbers are lowest. Conventional supplementation will be used as well, and over time as run strength increases, the goal is to shift entirely to a conventional supplementation program. The offspring of adult capture could also be used for the captive broodstock component. The main steps in the captive broodstock component of the program (see Figure 1) include the following actions:

- Capture spring chinook salmon parr from the Upper Grande Ronde River, Catherine Creek, and Lostine River for use as broodstock, using screw traps or seines (as previously done).
- Up to 500 parr would be collected from each stream.
- Rear parr to smolt size at the existing Lookingglass and/or Irrigon Fish Hatcheries;

Figure 2. Sites of Proposed Adult Collection and Juvenile Acclimation and Release Facilities

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- Transfer smolts to existing facilities at the Bonneville Fish Hatchery near Cascade Locks, Oregon and Manchester Hatchery near Bremerton, Washington, where they will be raised to maturity;
- Transfer adults from Manchester to Bonneville Fish Hatchery, and spawn all mature adults at Bonneville Fish Hatchery;
- Transfer eggs from Bonneville Fish Hatchery to Lookingglass and/or Irrigon Fish Hatcheries, where they will be raised to smolt size;
- Transfer smolt-size fish to proposed new acclimation and release facilities to be constructed in three target drainages, where they will be held for a short period of time (up to two months) for imprinting and released to migrate to the ocean. Up to 200,000 spring chinook salmon smolts would be released annually in each stream (i.e., up to 600,000 for the overall program).

Conventional Supplementation: This component of the program will be used when sufficient returning naturally-produced spring chinook salmon adults are available. It includes the following main steps:

- Collect naturally-produced adults from proposed new adult collection facilities on the Upper Grande Ronde River, Catherine Creek, and the Lostine River;
- Transfer these adults to the existing Lookingglass and/or Irrigon Fish Hatcheries for holding/spawning;
- Rear offspring to release size at the Lookingglass and/or Irrigon Fish Hatcheries;
- Transfer offspring to proposed new acclimation and release facilities constructed in three target drainages, where they will be held for a short period of time for imprinting and then released.

Monitoring and evaluation will be used to gauge the effectiveness of the program relative to its purposes. The results of the monitoring and evaluation will be used to modify details of the program actions, as needed.

A monitoring and evaluation plan will be developed in accordance with requirements of the ESA Section 10 permit (as modified) issued on June 20, 1997. The plan will be prepared by the fisheries co-managers (ODFW, CTUIR, and NPT) and submitted to NMFS (by ODFW) on or before March 1, 1998. This plan will describe approaches for:

- counting and sorting returning spring chinook salmon adults at adult collection facilities;
- monitoring the impact of activities at other program locations (e.g., juveniles trapping locations, juvenile acclimation and release facilities, and participating hatcheries);
- surveying local spawning grounds to help determine the incidence of adult straying (i.e. returns to non-natal streams).

One adult collection facility and one acclimation and release facility will be built on Catherine Creek, the Upper Grande Ronde River, and Lostine River, resulting in a total of six sites (see Figure 2). The adult collection and holding facilities will be constructed at sites suitable to intercept adult spring chinook salmon returning to spawn.

The juvenile fish acclimation and release facilities will be constructed at sites farther upstream. New facilities for the capture of parr for rearing in captivity are not needed as part of the Proposed Action Alternative because screw traps already exist on each stream and have been previously used by ODFW, NPT, and CTUIR to collect parr.

The fisheries co-managers collected have indicated that they plan to collect some returning naturally-produced spring chinook salmon adults in the three target streams during 1997. This action would involve the use of temporary adult collection facilities in approximately the same stream reaches addressed in this Preliminary EA. The adults collected were used as part of a conventional supplementation effort intended to take advantage of an adult run projected to be considerably larger than recent or predicted near-future returns. **Weirs** were used in each site stream to collect the adults. The installation of the weirs in 1997 had two purposes: (1) to collect baseline information (monitoring and evaluation) on the adult spring chinook salmon population prior to supplementation and (2) to collect adults for captive broodstock.

2.1.1 Adult Facilities, Operations, and Sites

The following descriptions of program facilities are based on current, 90 percent complete preliminary design plans (Montgomery Watson, 1997). Final Refined designs for the facilities will be provided in the Final EA.

The purpose of the adult collection facilities is to allow the operators to count the adult fish entering the trap, sort them by origin (e.g., captive broodstock or natural fish), take broodstock for the conventional supplementation program as needed, and obtain other data needed for the monitoring and evaluation studies. Collection facilities would be staffed around the clock during trapping operations. Generally, fish would not be held more than 24 hours at the adult collection facilities. The facilities could also be used to capture adults for conventional supplementation.

Each facility would consist of a picket weir, trap structure, holding pond, water supply intake, and a water discharge. Each would also have the equipment needed to transfer fish to a transport vehicle when removal of fish from the stream is necessary. Plans for construction, operation, and development of the three adult collection facilities are summarized below. An example adult collection facility is illustrated by Figure 3.



Figure 3. Example of Proposed Adult Collection Facility, Catherine Creek

Adult Collection Facilities and Operations

The proposed adult collection facilities generally consist of picket-style weirs held in place by concrete abutments. An existing fish ladder in place at the Catherine Creek site will provide the concrete abutments and sill needed to support this weir. Concrete abutments will need to be built at the other two sites. These picket weirs will prevent upstream migration and guide fish into traps.

Trapping will be accomplished by directing adults into an off-channel holding area. Fish transfer from holding to transport (if needed) will be accomplished with relatively simple lifting equipment that involves water-to-water transfer of fish (i.e., fish are not exposed to air during transfer). Short-term adult holding at the site will be incorporated into existing structures where possible. Water will be supplied to the holding pond by gravity, if possible, but will be pumped from the stream when necessary. No well water will be used (Montgomery Watson, 1997).

Proposed plans are to release any adults originating from captive broodstock above the weir to spawn naturally. Adults originating from conventional supplementation or natural production could be collected for broodstock and transported to the Lookingglass and/or Irrigon Fish Hatcheries. Plans for the utilization of returning adults are being developed by fisheries co-managers.

The three adult collection and holding facilities will be generally the same, except for variations due to site-specific requirements. The essential components and characteristics of each adult collection facility are described below.

Fish Weir:

- picket weir that spans the full width of the stream, held in place by concrete abutments or other structures located on each stream bank. These structures prevent upstream migration and guide fish to the off-channel holding pond. The weirs have been designed to ensure that they are "fish friendly," i.e., they avoid or minimize any potential effects on either **anadromous** or **resident fish**.

Trap and Holding Pond:

- gravity water supply to off-channel holding preferred (pumped supply as an alternative);
- (at Catherine Creek only) the water supply would be designed to provide a maximum 1.1 cubic meters per second (m^3/s) (40 cubic feet per second [cfs]) flow to enhance attraction to the trap entrance;
- one holding pond per site sized to accommodate a maximum of 75 adult spring chinook salmon for up to 24 hours;
- maximum holding density of 0.2 cubic meters (8 cubic feet) per fish, resulting in a 17-cubic-meter (600-cubic-foot) holding pond;
- minimum water flow (at 10° C or 50° F) of 3.8 liters (1 gallon) per minute per fish, resulting in a 285 liter (75 gallon) per minute total flow (required flow increases with water temperature);
- fiberglass, plastic, or aluminum to be evaluated for the holding ponds; concrete to be used where the holding pond is incorporated with existing structures (i.e., at Catherine Creek).

Trap and Holding Pond Operating Characteristics:

- used for sorting, counting, and identifying the originoriginal of returning adult fish and for temporary holding of fish to be used as broodstock (any fish to be removed would be transported to long-term holding within 24 hours following capture but could be held in the pond for longer periods if needed);
- mechanical, water-to-water transfer of fish from holding to transport vehicle (assumed to be via 750- to 1,100-liter [200- to 300-gallon] tanks on

- trailers) and then to the long-term holding site, such as the Lookingglass and/or Irrigon Fish Hatcheries;
- any fish mortalities would be handled as prescribed in annual operating plans for applicable hatcheries.

Site Development:

- instream excavation required for holding pond walls at existing structures and for water supply inlet and outlet structures;
- portable generators (natural gas) used to supply any electric power needed if power is not available on site;
- on-site access road improvements and gravel or concrete pad for a seasonal staff trailer.

Period of Use:

- collection facilities would be in continuous use from about mid-May through September each year.

Staffing/Accommodations:

- facility staffed with one to two employees 24 hours per day during operation;
- a small temporary trailer at each site during operations to accommodate two persons, with an electrical hookup provided at sites near a power line (or a generator at other sites);
- potable water from containers brought to site (no wells to be developed);
- sanitary systems to consist of a sump for graywater disposal and a portable toilet for domestic waste.

Adult Collection Sites

Upper Grande Ronde River

The proposed Upper Grande Ronde River adult collection site is located on federal lands in Section 13,15, T5S, R35E, within the Wallowa-Whitman National Forest (see Figure 2). The site is near the downstream (northern) limits of Vey Meadows, on the west bank of the river. U.S. Forest Service (USFS) Road 51 lies opposite the site across the Upper Grande Ronde River, just north of the junction with USFS Road 4305. The entrance to the USFS River Campground is also located on the west bank of the river immediately upstream from the proposed collection site, which lies between the campground loop road and the river.

There are no existing instream structures at this site that would provide a readily adaptable base for a picket weir. However, a side channel around a small island in the river would provide an excellent location for the holding pond facility, while requiring only minimal disturbance during construction. The river has an approximate 1-meter (3-foot) elevation drop at this location, allowing for a gravity water supply from the river to the holding pond. and will be summarized in the Final EA. In the absence of such plans, treatment of this site in the Draft EA is based on general conceptual information concerning site development.

There are no existing instream structures at this site that would provide a readily adaptable base for the collection weir, so instream construction would be necessary to install a concrete sill and abutments. However, a side channel around a small island in the river would provide an excellent location with minimal construction disturbance for the holding facility. The river has a 3-foot elevation drop at this location, allowing for a gravity water supply from the river to the holding facility. Access to the site is from the campground access road, which intersects USFS Road 51 approximately 0.8 kilometer (0.5 mile) to the southeast (upstream) where USFS Road 51 crosses the river. The campground road would not likely need to be modified to accommodate construction and operation traffic, but a short spur from the campground loop to the river bank would be needed. This spur would pass through an existing meadow area, and minimallittle clearing would be needed. A gravel pad could be constructed for a small staff trailer, or one of the existing campground sites could be used for placement of the trailer. Electric power is not available at the site, so portable generators would be needed to supply electricity.

Catherine Creek

The proposed Catherine Creek adult collection site is located in Sections 28 and 29, T4S, R40E, about 8 km (5 miles) east of the city of Union (see Figure 2). The trap and holding pond facility would be built on a 1-hectare (2.5-acre) site at the existing fishway just downstream from Union's new fishway and water supply diversion structure, which was constructed in 1995.

The trap would be constructed on the north bank of the fishway where the ground is relatively flat; the south bank forms a steep rock abutment. The picket weir would be attached to the existing fish ladder. It would extend 16 meters (54 feet) across the ladder. The picket panels would be approximately 1 meter (3 feet) in height and 2.4 meters (8 feet) long. The weir (at this site only) would be a "floating" picket panel system that would be mounted on the existing diversion structure (Montgomery Watson, 1997). This design facilitates movement of floating debris past the weir.

The water supply for the adult trap would be drawn from Catherine Creek upstream from the fishway. The creek has approximately 2.1 meters (7 feet) of fall between the upstream and downstream ends, which allows incorporation of a gravity water supply for the adult trap. The water supply intake would be located in the existing fishway wingwall upstream from the trap. A slide gate and a **trashrack**, would be provided at the pipeline entrance, along with a jib crane for handling the trap. Water would be conveyed to the trap by a structure capable of providing a velocity up to 1.1 m³/s (40 cfs). Water would pass through the trap and discharge back to the stream.

Access to the site from Oregon Highway 203 is via an existing dirt access road. A locked gate at the access road entrance provides site security. The existing access road would be realigned and improved to allow the fish transport truck access to the trap. Electric power is available at the city of Union intake pump station located approximately 150 meters (500 feet) to the west of the proposed trap location. Electric lines would be extended from this location to the facility site, a span that would require two or three new wood poles.

Lostine River

The proposed Lostine River adult collection site is located in Section 30, T1N, R43E on private property of the Willet Ranch. The site is about 5 kilometers (3 miles) southeast of Wallowa. It is near the confluence of the Lostine and Wallowa Rivers (see Figure 2). The stream channel at the site is braided, characterized by gravel bars, and appears to move frequently between the banks during flood events. The river drops approximately 1 meter (2 to 3 feet) in elevation at the site.

A portable, temporary collection weir and small seasonal staff trailer were used at this site in 1997. Due to the instability of the stream channel, continued use of an existing portable weir and trap system is the preferred option for collection of adult fish at this site. This would provide the most flexibility in terms of operation and accommodation of anticipated changes in streambed morphology (i.e., the system could be placed in the best location within the channel each year).

Two other options were considered for this adult collection facility, but these are less feasible because they are cost prohibitive or would require extensive instream work and annual gravel removal to keep the permanent trap structure clean and operational. These options would be (1) to construct an essentially "in-stream" trap and holding area on the north bank (with removable stop logs at the upstream end to allow flushing of gravel from the trap structure) and a concrete apron spanning the river to mount the picket weir, or (2) to construct a trap and holding pond on the north bank with a fish ladder to lead fish into the holding pond. The latter option would require construction of about 150 to 250 meters (500 to 800 feet) of pipeline, at significant cost, to provide a gravity intake or a pumped water supply.

Access to the site on the north bank from Baker Road is via an existing gravel access road approximately 0.3 kilometer (0.2 mile) long. This road would require widening and other improvements to accommodate project construction and operation traffic. Access to the south bank from State Highway No. 82 is via an existing dirt field road approximately 0.8 kilometer (0.5 mile) long; this road ends in a fallow pasture approximately 30 meters (100 feet) from the river. No improvements to this road are anticipated during construction; however, road repairs due to project use may be necessary post-construction. Existing gates on both access roads would be replaced with new steel pole gates to improve site security. The existing gravel parking area and trailer pad on the north bank would be used for the proposed facility as well. A new transformer and pole would be installed on the north bank at the site to provide electrical power.

Juvenile Facilities, Operations, and Sites

Under the Proposed Action Alternative, parr would be collected for a minimum of 5 years, suggesting that the juvenile acclimation and release facilities for the captive broodstock component of the program would be needed at least through the spring of 2004. According to current projections, the conventional supplementation component of the program would begin to be more fully utilized at this time. No goal or target date has been set for termination of the project (Carmichael, 1996).

Three juvenile acclimation and release facilities would be constructed and operated—one site each on Catherine Creek and the Upper Grande Ronde and Lostine Rivers. Each facility would consist of a water supply intake and outfall, a water supply pipeline, up to four **raceways** for the temporary acclimation of juvenile fish, and drain/fish release pipes from the raceways to the stream. Plans for constructing and operating the facilities and for developing the three sites are summarized below, and an example juvenile acclimation and release facility is illustrated by Figure 4.

Juvenile Acclimation and Release Facilities and Operations

The acclimation and release facilities are to be designed as "portable" raceways, if possible, rather than permanent concrete structures. Portable in this sense refers to the ability: (1) to transport modular pieces of the raceways to the site; (2) to assemble the unit on site; and (3) to disassemble and remove the unit from the site. Although not planned at this time, disassembly and removal could occur annually, if needed, or at some time in the future should the program change location or at its termination.

The acclimation and release facilities would be generally uniform among the sites; however, the water supply may be either a gravity or pumped system (i.e., from the stream but not from wells) depending on site-specific features and requirements. The facilities would use existing surplus

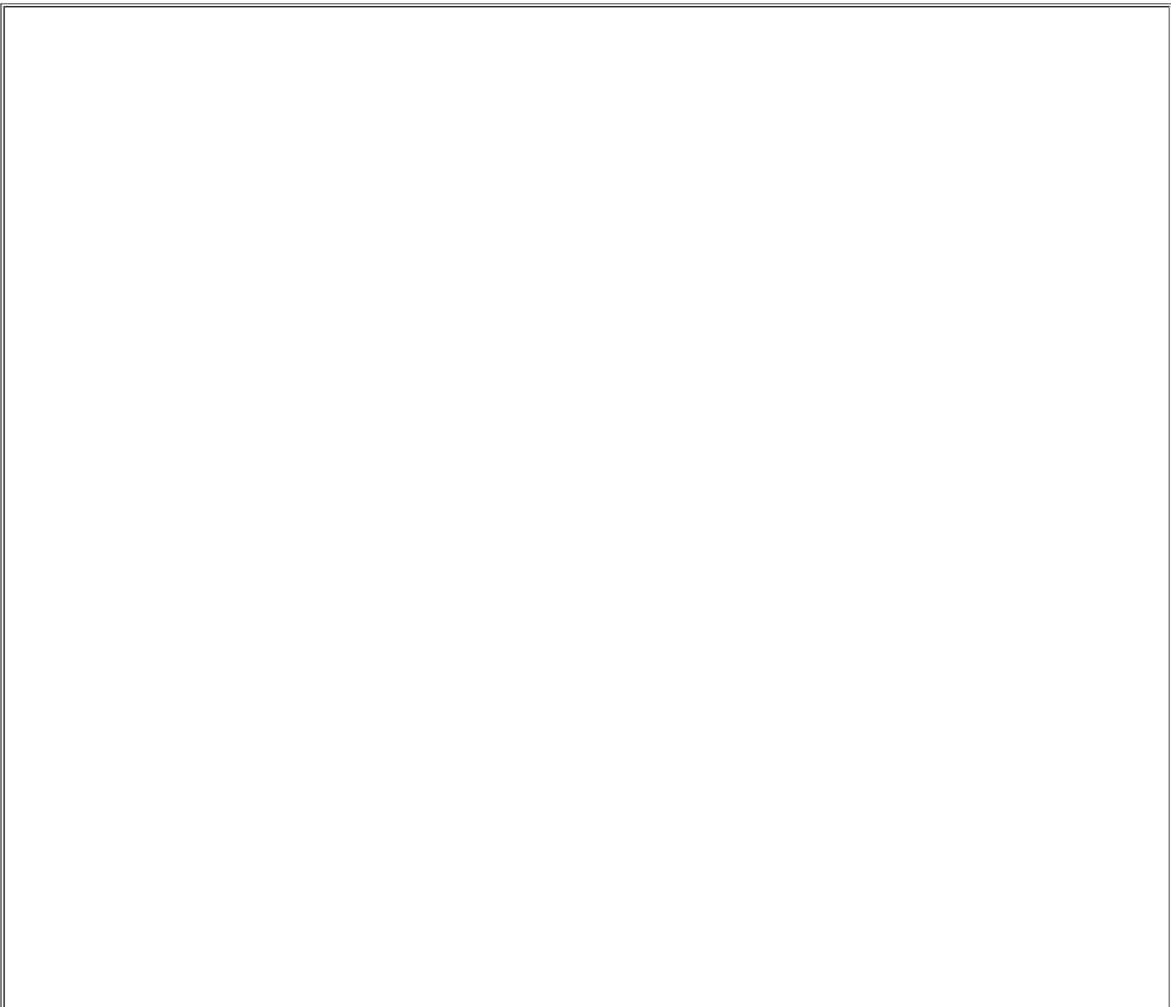


Figure 4. Example of Proposed Juvenile Acclimation and Release Facility, Lostine River

vinyl-lined, steel-frame raceways that are currently located at the WDFW's Klickitat Salmon Hatchery near Glenwood, Washington. The raceways would be disassembled, transported to each of the three Grande Ronde Basin acclimation and release sites, and reassembled.

The features and basic design criteria for the Proposed Action Alternative's juvenile acclimation and release facilities are provided below.

Raceways:

- up to four raceways per acclimation and release site;
- each is approximately 2.4 meters (8 feet) wide by 30 meters (80 feet) long;
- each has a 1.2-meter (4-foot) wall height with an 0.9-meter (3-foot) water depth;
- raceway liner of black-colored vinyl;
- patterned or colored sidewalls;
- camouflage or other appropriate netting type to cover each raceway;
- subsurface introduction of feed with minimal human intervention.

Water Supply:

- water supply at a rate to provide two turnovers per hour or approximately 0.04 m³/s (1.5 cfs) per raceway of the dimensions listed;
- water supply to be separate for each raceway with total water requirement per acclimation site at approximately 0.14 m³/s (5 cfs);
- water supply pumped from the stream if gravity intake development is not practical (one duty and one backup pump per site);
- intakes to be constructed with fish screens to meet 0.13 m/s (0.4 feet per second [fps]) maximum approach velocity criteria;
- all water will be returned to the source stream by an outfall pipe.

Site Development:

- raceway to be placed up to 0.6 to 0.9 meter (2 to 3 feet) below grade, requiring some excavation;
- instream excavation required for intake and outlet structures;
- portable generators (natural gas) to be used to supply any power that is not available on site;
- gravel access road and concrete or gravel pad for staff trailer.

Operating Characteristics:

- fish to be transported to acclimation site in large tank trucks;
- 0.9-meter (3-foot) maximum height between grade level and top of raceway to allow transfer of fish into raceway from tank truck;
- water-to-water transfer of fish from transport to raceway;
- juveniles to be released from the acclimation raceways to the adjacent stream by removing screens at the outlet of the raceway;
- both volitional release and forced release by draining raceways to be accommodated;
- estimated rearing density of about 0.45 kilogram (1 pound) of fish per 0.03 cubic meter (1 cubic foot) of water or up to 200,000 fish per site;
- on-site feed storage containers to accommodate a 1-week supply of feed;
- any fish mortalities/moralties would be handled as prescribed in annual operating plans for applicable hatcheries.

Period of Use:

- on average, acclimation would occur from early February through mid-April.

Staffing/Accommodations:

- facility staffed by one to two persons 24 hours per day during operation;
- a small trailer at each site to accommodate two persons, with electrical hookup at sites near a powerline (or use of a portable generator);
- potable water from containers brought to site, (no wells to be developed);
- sanitary systems to consist of a sump for graywater disposal and a portable toilet for domestic waste.

Juvenile Acclimation and Release Sites

Upper Grande Ronde River

The proposed Upper Grande Ronde juvenile acclimation and release site is located in Section 5, T6S, R36E, about 30 kilometers (20 miles) southwest of La Grande (see Figure 2). The site occupies approximately 1 hectare (2.6 acres) of federal lands near the upstream (southern) limits of Vey Meadows and a National Forest System and private landowner boundary. The site is located between USFS Road 5125 and the Upper Grande Ronde River. The area is currently used as a campground, although there is limited development of campsite facilities. The raceways would be located in a relatively flat area at the north end of the site. The water supply intake location is approximately 170 meters (550 feet) south of the raceways. Pine, fir, and brush are found throughout the site with several clearings present.

The proposed raceway location is in an existing clearing. No large (≥ 53 centimeters [21 inches] diameter at breast height [dbh]) trees would be removed from the site, although a few smaller trees and some brush would have to be removed to provide access. A gravel top course would be placed on the dirt road to provide a more weather-resistant driving surface. Space would be provided adjacent to the raceways to accommodate a seasonal staff trailer.

An existing dirt road extends from USFS Road 5125 through the campground area and would provide access between the raceways and the water supply intake. The water supply pipe would be buried under this road to minimize impacts to existing vegetation. The acclimation and release site is located in a remote area not served by local utilities. A natural-gas-powered generator would be required to provide electricity for the trailer. Snow removal on USFS Road 5125 and the site road would be needed in some years.

The water supply for the acclimation and release facility would be drawn from the Grande Ronde River. The river has approximately 6 meters (20 feet) of fall between the intake and outfall pipes, providing up to 0.14 m³/s (5 cfs) through the raceways via gravity. The raceway drain/fish release pipes (outfall) would be routed through existing trees to the Grande Ronde River. This pipe will return all diverted flow back to the river.

Catherine Creek

The proposed Catherine Creek acclimation and release site is located in Section 21, T5S, R41E, about 16 kilometers (10 miles) southeast of the city of Union (see Figure 2). The site occupies about 0.5 hectare (1.2 acres) on property owned by Oregon State University (OSU) and operated as an agricultural experimental station. The site is located on the northern bank adjacent to USFS Road 7785. The site slopes gently to the west. Ponderosa pine, fir, and brush are found throughout the site.

The proposed raceway location is in a relatively flat area just west of the gated entrance to the site, which lies between the creek and the steep hillside. The site would have to be cleared and graded to allow installation of the raceways. Space for a seasonal staff trailer would be provided adjacent to the raceways.

The water supply intake location is approximately 60 meters (200 feet) west of the raceways. The water supply for the acclimation and release facility would be drawn from Catherine Creek. The creek has approximately 0.3 meter (1 foot) of fall between the intake and outfall pipe locations, which is insufficient to allow for a gravity water supply. A pump would be used to lift water from Catherine Creek to the raceways. An emergency backup pump would be incorporated into the intake facility for use if the primary pump fails. Screens would be placed at the intake to avoid **entrainment** of fish. With a pumped supply, temporary piping could be installed and removed each year. The drain/fish release pipes would be routed to a discharge point just downstream from the intake. All stream-diverted water would be returned to Catherine Creek by this pipe. Similar to the water supply pipe, the drain lines could be installed and removed each year.

Access to the site is provided via USFS Road 7785, which intersects Oregon Highway 203 0.8 kilometer (0.5 mile) to the west. An existing dirt road to the OSU property would be improved for access to the acclimation and release facility. The road, raceway pad, and trailer area would be graveled. The acclimation and release site is located in a remote area not served by local utilities. Electric power would be provided by extending a wood-pole overhead line approximately 4 kilometers (2.5 miles) to the site. The local utility would construct the line and be reimbursed through project construction funds.

Lostine River

The proposed Lostine River acclimation and release site is located in Section 27, T1S, R43E, about 4 kilometers (2.5 miles) south of the community of Lostine and adjacent to the Lostine River Road (see Figure 2). The 1.1-hectare (2.6-acre) site is on the east bank, opposite an existing irrigation diversion, and within the Krieger Ranch property. The east bank is flat, with only 0.3 meter (1 foot) of ground relief from the water supply intake to the raceways.

The preferred site for the Lostine River facilities has been identified. However, acquisition of the property at this site may not be possible. Therefore, an alternative site, likely located within 5 kilometers (3 miles) of the proposed site, may be needed. It is anticipated that the design, construction, and operation of the alternate facilities would be nearly identical to the preferred site, and potential effects of the facility and construction would be similar to those of the preferred site.

The proposed raceway location is in an existing clearing between the toe of the hillside and the river, approximately 120 meters (400 feet) north of the intake. Minimal site clearing would be required to construct a base pad for the raceways. Space for a seasonal staff trailer would be provided adjacent to the raceways. An existing gravel road currently provides access from the paved Lostine River Road to the site. This road would be widened and improved to allow truck access. A new gravel access road would be constructed to the raceways. The road would be routed near the toe of the hill slope to minimize impacts to the existing meadow. All construction and operation activity would occur on the east side of the river. A powerline that extends from the Lostine River Road to a pump station adjacent to the site would be extended to the trailer.

The water supply for the acclimation and release facilities would be drawn from the Lostine River. The intake would be located immediately downstream from an existing bridge. The river has only approximately 0.3 meter (1 foot) of fall between the intake and outfall pipe locations. Therefore, water would have to be pumped from the river to the raceways. Temporary piping could be installed and removed each year, a practice that may be required by the landowner. The drain/fish release pipes would be routed to an existing pool in the Lostine River approximately 45 meters (150 feet) north of the raceways. All diverted water would be returned to Lostine River through this pipe.

Monitoring and Evaluation

The outcome of the Proposed Action Alternative captive broodstock project cannot be predicted with a high level of certainty because there are many key environmental variables, such as ocean or river conditions, disease, and predator/prey relationships, that will affect the results. Thus, long-term monitoring and evaluation are proposed to evaluate the effects and effectiveness of the proposed program activities. Results of these studies would help the project's managers to determine: (1) whether to continue with the project as planned or (2) whether to develop appropriate and timely corrective actions should effects appear to be adverse.

The proposed monitoring and evaluation component of the program is outlined in the ODFW's ESA Section 10 application to NMFS (Carmichael, 1996) and will be supplemented or adjusted as necessary through annual operating plans (e.g., Carmichael, 1997). The Section 10 permit (No. 1,011) granted for this application was modified on June 20, 1997 (see Section 1.1.3) to additionally include the collection of returning adult spring chinook salmon at temporary facilities during 1997. A special condition of the modified permit requires the development of a long-term management plan for the Grande Ronde Basin. All provisions of this plan, as it is finalized after consultation with NMFS, will be incorporated into the proposed program. The plan needs to include five primary parts: (1) a benefit/risk analysis of proposed actions; (2) a genetic management plan; (3) an adult collection plan; (4) a juvenile release plan; and (5) a monitoring and evaluation plan. The overall long-term plan will be prepared by the co-managers and submitted to NMFS (by ODFW) on or before March 1, 1998, as required by the permit (personal communication, Diaz-Sultero, 1997).

The monitoring and evaluation plan will build on baseline data collected over a number of the years and on studies conducted for the Proposed Action Alternative., and it will be geared toward comparisons of pre- and post-project conditions. At all times, great care will be taken to minimize stress and adverse effects that

monitoring activities could have on the subject fish. The monitoring and evaluation program will assess all phases of the Proposed Action Alternative, including the following aspects: captive broodstock project, include

- the condition and survival of naturally-produced adult broodstock during adult capture, transport, holding, and spawning;
- pre-smolt growth and **smoltification** in the captive juvenile period;
- post-smolt growth, maturation, and spawning in the captive adult period; and
- incubation, juvenile rearing, smolt releases, and adult returns for the subsequent generations.

Monitoring activities will be undertaken: (1) at the existing juvenile traps; (2) at the adult collection facilities and the juvenile acclimation and release facilities; and (3) at the hatchery facilities involved in the captivity phases of the program. In addition, spawning ground surveys will be conducted in the Upper Grande Ronde River, Catherine Creek, and the Lostine River and in other streams in northeastern Oregon to determine the incidence of possible straying of the captive broodstock fish.

The success of the proposed captive broodstock approach of the program will ultimately be determined by the following criteria:

- natural smolt production;
- adult returns to the Upper Grande Ronde River, Catherine Creek, and the Lostine River;
- retention of naturally-produced spring chinook salmon characteristics in the captive broodstock and conventional supplementation offspring populations; and
- the impact on the indigenous resident and anadromous fish populations.
- numbers of naturally-produced juveniles leaving the Grande Ronde Basin;
- smolt-to-adult survival rates that are similar between natural and captive broodstock fish or conventional supplementation fish (as measured by the number of adults returning to the Grande Ronde subbasin);
- distribution of the species throughout its habitat with minimal straying into foreign areas within the basin;
- maintenance of natural fish run timing, age structure, and fecundity;
- minimal interaction of captive broodstock or conventional supplementation fish with other anadromous and resident fish;
- minimal numbers of Grande Ronde Basin stocks straying to other basins.

The information collected from the monitoring and evaluation aspect of the proposed program would be used to determine if these performance criteria are being met.

2.2 No Action Alternative

The No Action AlternativeNo Action alternative would represent a decision by BPA not to fund the Grande Ronde Basin Endemic Spring Chinook Salmon Supplementation Program. Assuming no other funding sources are available, this alternative allows Grande Ronde Basin spring chinook salmon to continue to reproduce naturally, without human intervention to directly increase the numbers of adult fish returning to spawn naturally in the three target stream reaches. The programcaptive broodstock project sponsors would continue to monitor and evaluate spring chinook salmon distribution and survival from natural production.

There are other ongoing or planned actions to assist recovery of ESA listed spring chinook salmon in the Columbia and Snake Rivers system (e.g., actions to be undertaken through the NPPC Fish and Wildlife Program or the Draft NMFS Recovery Plan). These other actions would presumably not be affected by the No Action AlternativeNo Action alternative.

2.3 Alternatives Not Considered in Detail

The Proposed Action Alternativecaptive broodstock project has been under discussion and development for several years, during which ODFW, CTUIR, NPT, and BPA have considered various alternatives to the proposed program. Based on their evaluations of alternative measures, BPA has decided not to consider the following potential action alternatives in detail in this Preliminary EA for the reasons detailed below.

2.3.1 Measures Not Involving Supplementation

The need for recovery measures that address factors in **salmonid** population declines in all phases of the life cycle has been of much concern throughout the Pacific Northwest. These factors include mortality during migration through the hydro system, limited and poor quality habitat, hatchery operations, and excess harvest. NMFS is responsible for making decisions on all elements of recovery, as detailed in the Draft Recovery Plan (NMFS, 1995a).

BPA and other entities are implementing recommended recovery measures that collectively address all phases of the life cycle and that will continue regardless of the decision on the Proposed Action Alternative. In general, potential alternative measures that involve hydro system operations, hatcheries, habitat, or harvest alone would not meet the need and purposes defined for this program, and therefore these options have not been considered in detail in this Preliminary EA.

Habitat improvement is typically one of the measures considered or available when addressing plans to restore fish runs in a specific basin or stream. BPA is working with the Grande Ronde Model Watershed Program and funding major habitat work throughout the Grande Ronde River watershed. Because of the extremely low numbers of returning adult spring chinook salmon in the Grande Ronde Basin, however, habitat improvement would not meet the program need at this time. Even though much of the existing spawning and especially the rearing habitat is of poor quality (ODFW, et al., 1989), it is underutilized due to current extremely low returns. Therefore, habitat quality and quantity would not likely be a limiting factor for the Grande Ronde Basin spring chinook salmon population unless or until the number of returning natural spawners increases.

2.3.2 Other Supplementation Measures

Other types of supplementation measures are potentially available and have been considered by the fisheries managers. One way to supplement natural production is to expand the current use of Rapid River spring chinook salmon stock at Lookingglass and Rapid River Hatcheries to produce smolts for release in the Grande Ronde Basin. However, continued use of Rapid River stock would entail genetic risk for the local stock and would be inconsistent with NMFS' Biological Opinion for Hatchery Operations (NMFS, 1995b) and its Draft Recovery Plan (NMFS, 1995a), which recommend development of endemic broodstock at Lookingglass Hatchery and termination of the use of Rapid River stock at Lookingglass., and tTherefore, this approach would not comply with the project purposes identified in Section 1.1.1.

2.3.3 Alternative Sites

In the past, the fisheries co-managers (ODFW, CTUIR, and NPT) have considered a wide range of potential sites for the proposed adult collection and juvenile acclimation and release facilities in the Grande Ronde Basin (Montgomery Watson, 1997). The six sites described in Section 2.1 and included in the Proposed Action Alternative represent the fisheries co-managers’ collective identification of the most preferred sites for these activities. The co-managers consider other sites to be less advantageous for the Proposed Action Alternative, and therefore, these are not considered in detail in this Preliminary EA. While some or many of these sites might prove to be viable, they have potential limitations related to water supply, location relative to known and currently used spawning and rearing areas, site accessibility and development potential, and/or the potential for use of the sites. Nevertheless, if preferred sites cannot be acquired, less desirable sites may need to be developed for project purposes. If this happens, supplemental site-specific environmental coverage of such added sites would be provided.

2.4 Comparison of Alternatives

In determining the most appropriate course of action, BPA has evaluated the Proposed Action Alternative and the No Action Alternative on the basis of their environmental effects and the degree to which each would satisfy the project purposes. Table 11 indicates whether the Proposed Action Alternative and No Action Alternative would accomplish the purposes that BPA and the project sponsors hope to achieve with this endemic spring chinook salmon supplementation program.captive broodstock project. The environmental effects of the two alternatives are summarized in Table 22, which is presented at the beginning of Section 3.

Table 1. Predicted Performance Summary

Purpose	Proposed Action Alternative	No Action Alternative
Consistent with the NPPC Fish and Wildlife Program and with the NMFS Proposed Recovery Plan?	Consistent with NPPC Measure 7.3B for anadromous fish, and consistent with Task 4.1b of the Recovery Plan, as well as with the Biological Opinion for hatchery operations.	No
Enhances long-term survival chances for locally-adapted spring chinook salmon populations?	Yes	Uncertain
Maintains genetic attributes on a stream-specific basis?	Uncertain	Uncertain
Promotes the protection and maintenance of tribal treaty rights?	Increased action toward maintaining treaty rights	Extinction of spring chinook salmon would prevent the exercise of treaty rights
Utilizes new knowledge on the use of capture broodstock as a means to assist the recovery of endangered species?	Yes	No
Provides for administrative efficiency and cost-effectiveness?	Meets the biological objectives with minimal cost	Least cost but does not meet biological objectives
Protects other species and environmental resources?	Yes	Yes

SECTION 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This section describes the affected environment and the expected environmental effects for the Proposed Action Alternative and the No Action AlternativeNo Action alternative. Discussion of the affected environment focuses on the specific conditions at the six sites proposed for the development of adult collection or juvenile acclimation and release facilities.

The environmental effects addressed in this section include the direct, indirect, and cumulative effects of construction and operation of the facilities. Monitoring and evaluation of the facilities needed for the proposed program are also addressed.captive broodstock project. Tables 22 summarizes the existing conditions and the expected effects of the two alternatives. Additional information concerning compliance with applicable environmental requirements is presented in Appendix A.

As discussed in Section 2.1.2, an optional site may be needed for the Lostine River juvenile acclimation and release facility. It is likely that site conditions, facility design, and expected environmental effects for the alternate site would be essentially the same as those described in the following sections.

3.1 Physical Resources

3.1.1 Existing Environment

Geology and Soils

The proposed adult collection and juvenile acclimation and release sites along the Upper Grande Ronde River and Catherine Creek are located on thin strips of floodplain within canyon areas and have very similar soil types. The floodplains are underlain by terraces composed of relatively fine-grained material deposited during high flood stages. Runoff is slow on these soils, and the hazard of water erosion is slight. The soil is subject to brief periods of flooding in the winter and spring (Dyksterhuis and High, 1985).

The Lostine River sites are located in an open agricultural valley. The sites are on floodplain-type soils that are slightly different from the other sites. The soil depth is well over 1.5 meters (60 inches) deep to bedrock. It is poorly drained and has a slight erosion hazard. The soil is subject to flooding in the winter and spring (Dyksterhuis and High, 1985).

Table 2. Existing Environment and Impact Analysis Summary

Category	Existing Environment	Proposed Action Alternative	No Action Alternative
Physical Resources	Proposed action sites are generally on floodplain soils that have had varying degrees of past low-intensity disturbance. Adjacent streams are variously designated as water-quality limited as a result of fish habitat modification (e.g., flow modification, pH or sediment imbalance, and/or summer water temperatures).	Minimal impacts to local geology, soils, floodplains, and stream channels from limited surface disturbance and instream construction activity. Potential for minor, short-term soil erosion and associated sediment input, but controllable through best management practices (such as use of hay bales, reseeding, silt fences, or other structures to control runoff). Potential for damage to proposed facilities from recurrent local flooding.	Little or no change from current uses and physical disturbance sources.
Fish	Dramatic decline in endemic spring chinook salmon population in the Grande Ronde Basin; considered to be emergency situation with significant risk of extinction. Variety of warm-water and cold-water resident and anadromous fish species present in the Grande Ronde Basin, including the bull trout, a candidate species proposed for listing; and steelhead, a species listed as threatened proposed for listing under the ESA of 1973. In addition, the redband trout, listed as a USFS sensitive species, is present in the basin.	Expected increase in adult spring chinook salmon returning to spawn naturally, contributing to stabilization and potential future recovery of the species. Some risk of adverse genetic effects to salmon, but not as prominent as the risk of extinction. Minimal or minor potential for construction and operations effects through instream disturbance, increased competition, predation , nutrient contribution, entrainment or impingement , or handling and transportation stress. Potential for delays in migration or changes in spawning distribution due to the weirs. Minimal effects on local resident fish. Project facilities designed to minimize impingement risk for steelhead, bull trout, and redband trout.	Continued natural production of spring chinook salmon without human intervention, likely leading to extinction in the Grande Ronde Basin. Little or no change from current conditions for other fish species, although bull trout would lose a food resource if spring chinook salmon became extinct.
Vegetation	Variety of tree and shrub cover present at the proposed action sites, generally including a narrow band of riparian vegetation along the streambanks. Some degree of previous disturbance at all sites. No unique or sensitive vegetative communities or species known to be present, and none found during 1997 surveys.	Minimal loss or disturbance (including approximately 0.2 acre of palustrine-emergent wetland) from limited clearing of trees, riparian shrubs, and herbaceous vegetation for construction of proposed facilities. Pre-construction sMinor wetlands were identified on three sites. Minor potential loss or disturbance to these would occur.	Little or no change from current site uses and their associated influences on vegetation.
Wildlife	Riparian corridors, including proposed action sites, likely to be used for travel, forage, and cover by a variety of bird and mammal species. No recorded observations of endangered, threatened, or rare wildlife species occurring at any of the six sites; some recorded use in the general vicinity, and wintering and/or nesting use by bald eagles occurs in the general region.	Minor potential disturbance or displacement of wildlife during project construction and during the intermittent periods of operation. Minor potential loss or disturbance of cover and forage from limited clearing of trees and riparian habitat. Project construction and operation not likely to adversely affect the bald eagle or peregrine falcon. Bald eagles may benefit from anticipated increase in salmon prey base. Increased returns of spring chinook salmon could provide additional food sources for wildlife food sources for wildlife (e.g., bald eagles and bears).	Little or no change from existing site uses and their associated influences on wildlife.
Land Use	Variety of low intensity land uses at and near the six sites, including pastoral agriculture, water	Proposed uses compatible with existing uses at all sites; no existing uses displaced. Installation of	Little or no change expected from existing uses, although

	diversion and fish passage, and informal recreation. Upper Grande Ronde sites within national forest and subject to USFS management. Three sites on private land and one on Oregon State University (OSU) property under Union and Wallowa Counties' land use regulations.	facilities, including temporary on-site housing, would be a permitted or conditional land use depending on county zoning provisions. Potential temporary disturbance of recreation uses during construction at Upper Grande Ronde sites. Minimal long-term effects on recreation and aesthetics.	site management could change subject to applicable land use policies and regulations.
Cultural Resources	<p>Historic and prehistoric use of the Grande Ronde Basin by Native Americans for subsistence and for spiritual and ceremonial activities and beliefs. Mining, timber harvest, grazing, and settlement by non-natives generally date to 1860s.</p> <p>Extensive archaeological surveys with limited subsurface testing were conducted at the juvenile acclimation sites (where the majority of ground-disturbing activities will occur). No known cultural resource sites were recorded during the surveys. However, all sites must be considered to have a high potential for the presence of cultural resources.</p>	<p>No disturbance impacts to known, recorded cultural resource sites. Appropriate consultation and mitigation to be conducted if cultural materials discovered during ground disturbance.</p> <p>Potential long-term benefit to Native American subsistence uses and spiritual values if project results in increased numbers of endemic spring chinook salmon.</p>	Little or no change from current site uses and their respective potential for disturbance or enhancement of cultural resources.
Air Quality	Air quality generally good, although four of proposed sites are within regulated zone for La Grande nonattainment area. Voluntary local management program has recently been successful in maintaining air quality within the standards.	Minor, temporary emissions of particulates and hydrocarbons during construction. Negligible or no effect expected on air quality within La Grande nonattainment area.	Little or no change from existing site uses and emission sources.

Water Resources

The six proposed sites are located adjacent to three water bodies: the Upper Grande Ronde River, Catherine Creek, and the Lostine River. Table 3 presents discharge characteristics for these streams. Peak flows occur in late spring and early summer and correspond to the snowmelt period, which occurs April through July. Low flows occur in August and September during the latter part of the dry season.

Table 3. Stream Discharge Characteristics in Upper Grande Ronde River, Catherine Creek, and Lostine River near Proposed Facilities

Stream	Mean Annual Flow	Average Peak Flow	Average Low Flow
Upper Grande Ronde River	0.4 to 0.8 m ³ /s (15 to 30 cfs)	2.5 m ³ /s (90 cfs)	0.08 m ³ /s (3 cfs)
Catherine Creek	2.8 to 4.2 m ³ /s (100 to 150 cfs)	8.5 m ³ /s (300 cfs)	0.3 m ³ /s (12 cfs)
Lostine River	5.7 m ³ /s (200 cfs)	22.7 m ³ /s (800 cfs)	1.4 m ³ /s (50 cfs)

Section 303(d) of the 1972 Federal Clean Water Act requires Oregon (and other states) to identify waters that violate the state's water quality standards. The program facilities are located on reaches of streams that have been designated as water quality limited and placed on the Oregon's Section 303(d) list (Oregon Department of Environmental Quality [ODEQ], 1996). The list also identifies those streams where **fish habitat** has been negatively modified by human activities. Table 43 summarizes the water quality parameters for each stream reach potentially affected by the Proposed Action Alternative that do not meet state water quality standards.

Table 4. Water Quality Parameters in Violation of Oregon State Water Quality Standards		
Upper Grande Ronde River	Catherine Creek	Lostine River
Adult and Juvenile Fish Habitat Modification	Temperature (Summer)	Adult and Juvenile Fish Habitat Modification
pH (Summer)		Flow Modification
Sediment		Sediment

Temperature (Summer)		
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3.1.2 Potential Impacts of Proposed Action Alternative

Geology and Soils

The geologic effects of the Proposed Action Alternative are expected to be minimal, as are the impacts of geologic hazards on the sites. There are no earthquake or volcanic hazards in the region that could affect proposed facilities. Rockfalls from slopes are unlikely, given the topography at the sites and the nature of nearby slopes.

Impacts to soils, and impacts caused by soil properties are expected to be minimal. The soils at each site do not have characteristics that are adverse for the types of construction planned for the proposed facilities. The sandy and gravelly nature of the soil makes it unlikely the soils would shrink, swell, or collapse. The limited clearing or construction at each site would minimize soil disturbance; only narrow roads (where applicable) and the clearing of vegetation for pipes and acclimation raceways would cause any soil disturbance. Use of existing facilities, clearings, and roads will decrease the disturbance considerably. The minimal construction disturbance for the sites poses little risk of erosion because the soils have a low to slight erosion potential.

The construction of the adult collection facilities on the Upper Grande Ronde River and the Lostine River might cause disturbance to the streambanks and streambed. Erosion control measures, such as runoff control during concrete pad construction and sediment barriers (hay bales and silt fences) would be used during road grading and facility clearing. Construction at the Catherine Creek adult collection site would cause little disturbance to the stream banks and soils because most facilities are already in place.

Water Resources

Construction and operation of the adult collection and juvenile acclimation and release facilities are expected to have minimal impacts on water quality. Disturbance of the soils could cause minor wind or water erosion, but this would be short lived as the soils have low potential for erosion. The construction would affect very little aquatic habitat along the banks because the only structures located on the stream banks would be water intake and discharge/fish release pipes. Thus, bank erosion and aquatic habitat modification are not concerns. The flow diversion through pipes for the juvenile acclimation and release facilities would cause an increase in water velocity at the pipe outlet. This could locally scour the streambed or stream banks. However, this would likely have a minimal impact due to the small discharge flow through the outlet pipes.

Flooding is the greatest concern for project facilities because most structures (except portions of access roads) are within the 100-year floodplain (see Section 6 of Appendix A for floodplain/ wetlands assessment). Peak flows may occur during the operation of the facilities and could damage on-site structures if the streams flood. The Upper Grande Ronde River and Catherine Creek overflow their banks almost every April or May (2-year recurrent event [Boehne, 1997]).

The adult collection facility on the Upper Grande Ronde River would require instream construction, which could cause an increase in sediment downstream if the water is not carefully diverted around the construction site. Construction of this facility might also disturb the streambed if proper runoff control measures are not taken. A permit from the Oregon Division of State Lands would be necessary for any instream construction, and any mitigation conditions would be implemented.

The minimum water flow necessary for the Upper Grande Ronde River adult collection facility is 3.8 liters per minute (l/m) per fish (or 1 gallon per fish per minute) or a total flow of 284 l/m (75 gallons per minute [gpm]) assuming the allowable fish capacity (75 fish) for the adult holding facilities. The juvenile acclimation and release facilities on the Upper Grande Ronde River would require a maximum of about 8,494 l/m (or 2,244 gpm or 5 cfs) for the period of use (February to April). Water requirements at the other sites would be similar.

On the average, there is sufficient water flow in the streams to meet needs without adversely affecting the stream flow between the intake and outlet structures. However, during February, low flows for the Upper Grande Ronde River juvenile acclimation and release facilities may not exceed 5 cfs. In these instances, it is likely that either a smaller number of fish or no fish would be transferred from the hatchery to the acclimation and release site. Conditions predicted during the February period would be closely monitored prior to any transfers.

Operation of the proposed facilities may require a water right permit from the Oregon Department of Water Resources (ODWR) for the withdrawal of water needed for the juvenile acclimation and release facilities. Because the water would be returned to the stream a short distance downstream from the intake location at each facility and because the diversion would not affect any downstream users, BPA is investigating whether a water right exemption would be applicable for the proposed facilities. As new water uses, the diversions at the six sites (see Figure 2) would be junior to all pre-existing water rights on the respective streams, and the ability to divert the full amount desired might be limited at times by upstream diversions.

Based on the planned number and size of fish to be acclimated at each facility, a National Pollutant Discharge Elimination System (NPDES) permit would not be required for operation of the juvenile acclimation and release facilities. The size of the juvenile fish to be released would correspond to a ratio of 7 to 9 fish per kilogram (15 to 20 fish per pound) of weight. Acclimation of up to 200,000 fish at each site would represent up to 6,040 kilograms (13,300 pounds) of fish, which is well below the permit threshold of 9,000 kilograms (20,000 pounds) of fish. Fish waste and excess food would be flushed seasonally from the tanks into the streams.

The operation of the three acclimation and release facilities would add nutrients to the site stream systems during the expected acclimation period (3 to 6 weeks) from about early February to mid-April. Fish would be fed during this period, and the addition of feces and uneaten food would increase the nutrients and organic matter in the site streams. The addition of this food would increase oxygen consumption in the local area through biological decay and might increase benthic algae primary production. Because the releases would occur during the early spring when the dissolved oxygen in the water would be high, a reduction in oxygen (even near the discharge point) should have no adverse effects. Also, the rapid dilution of the organic matter and nutrients would eliminate any adverse effects from this action.

The acclimation and release sites are all located above most other major sources of nutrient input to the site streams. Therefore, minor increases in nutrients would not be expected to have adverse effects in these naturally nutrient-dilute stream reaches.

3.1.3 Potential Impacts of No Action Alternative

The geology, soils, and water resources at the project sites would not be subject to the minor disturbance from construction of the proposed facilities if the No Action AlternativeNo Action alternative is implemented. The level of potential physical disturbance at these sites would be based on continuation of existing low-intensity uses or shifts to other activities dependent on ownership and management of the respective sites.

3.2 Fish

3.2.1 Existing Environment

The Grande Ronde Basin historically supported anadromous stocks of spring and fall chinook salmon, coho salmon, sockeye salmon, and summer steelhead. Coho and sockeye salmon are no longer present in this basin. The spring and fall chinook salmon are listed as threatened and the summer steelhead have been proposed for listing as endangered (Federal Register, August 9, 1996). Summer steelhead are also listed as threatened (Federal Register, August 18, 1997). Fall chinook are currently limited in their use of the basin in both numbers and distribution, with current spawning areas only in the lower mainstem reaches of the Grande Ronde River.

Resident fish present in the Grande Ronde Basin include redband trout, rainbow trout, bull trout, brook trout, mountain whitefish, suckers, dace, redbside shiners, chiselmouth, northern squawfish, carp, peamouth, sculpins, bass, sunfish, and bullhead catfish (Sims, 1994a and 1994b). Bull trout are currently a federal candidate species proposed for listing under the ESA (Federal Register, June 13, 1997).

Among the Snake River spring/summer chinook stocks, the Lostine River, Catherine Creek, and Upper Grande Ronde River spring chinook salmon stocks were all described by NMFS (1995a) as "high priority" stocks having the "greatest immediate risk" of extinction. NMFS (1995a) further noted that "captive broodstock and supplementation programs should be initiated and/or continued for populations identified as being at imminent risk of extinction." Additionally, considering the low abundance of native stocks in the Grande Ronde Basin, NMFS (1995a) recommended that "indigenous [or endemic] broodstock should be immediately transferred to Lookingglass hHatchery and production should be maximized to supplement natural populations." The Biological Opinion for 1994 to 1998 Hatchery Operations in the Columbia River Basin (NMFS, 1995b) reiterated the need to use "indigenous broodstock" at the Lookingglass hHatchery "to prevent extinction of local populations."

In the 1950s, **escapement** of spring chinook salmon to the Grande Ronde Basin exceeded 10,000 naturally-produced fish (Carmichael, 1996). In recent years, escapement has often been less than 1,000 fish (Sims, 1994a and 1994b). The Upper Grande Ronde River, Catherine Creek, and the Lostine River were historically major stream areas used for spawning by spring chinook salmon (Carmichael and Boyce, 1986, as cited in Carmichael, 1996).

Based on existing records (see Table 5), redd counts were highest in 1957, but recent redd counts have been very low. Assuming a ratio of 3:1 adult spring chinook salmon per redd, the most recent escapement to each of these streams has often been consistently less than a total of 100 fish.

Based on fish counts at Lower Granite Dam, total (hatchery and natural) spring chinook salmon adult returns to the Snake River were relatively high (33,855 spring chinook salmon) in 1997. Even though these returns are more than double the average return of the past 10 years (Fish Passage Center, 1997), the number of naturally-produced adult fish migrating upstream over Lower Granite Dam remains very low.

Returns of adult spring chinook salmon to the Grande Ronde Basin in 1997 were also predicted to be relatively high (about 200 to 400 fish for each site stream) (Carmichael, 1997). However, based on counts of fish at temporary weirs installed on these streams (see Table 6), escapements were lower than expected. The trend of relatively low escapement was also apparent in the redd counts on the Upper Grande Ronde River (see Table 5). It should be noted, however, that the late installation of the weirs on these streams may have affected overall counts of fish, because fish would have passed these sites prior to trap installation. This was especially true for Catherine Creek and the Lostine River, neither of which had weirs installed until July.

Fish collected at the temporary weirs that were not retained for broodstock were marked and released above the weirs to help provide information on estimates of total escapement. The Lostine River was the only stream where recaptures were sufficient to make an estimate of total

Table 5. Grande Ronde Basin Spring Chinook Salmon Redd Counts

Year	Upper Grande Ronde River	Catherine Creek	Lostine River
1957 ^{a/}	478	374 ^{b/}	893
1992	116	49	36
1993	103	84	112
1994	3	11	16
1995	6	14	11
1996	22	10	27
1997	19	46	49
Sources: Carmichael, 1996; Walters T., 1997; Parker, 1997			
a/ Values are estimates projected from index counts			
b/ Does not include the North Fork of Catherine Creek			

Table 6. Spring Chinook Salmon Captured in 1997 at Temporary Weirs in the Upper Grande Ronde River, Catherine Creek, and Lostine River

	Upper Grande Ronde River	Catherine Creek	Lostine River
Fish Type	(June 20 to Sept. 3)	(July 10 to Sept. 3)	(July 17 to Oct. 1)
Natural - Counted	9	1	25
Hatchery - Counted	0	0	2
Natural - Kept	1 ^{a/}	0	7
Hatchery - Kept	0	0	2 ^{b/}
Sources: Lofy, 1997; Ashe, 1997.			
a/ Collected June 27, held in captivity, and returned to the river on August 7.			
b/ Hatchery fish retained for a project not related to ongoing or proposed actions.			

escapement. The Lostine escapement estimate for 1997 was 162 (range 59 to 265) spring chinook salmon, which was lower than the range of the presampling prediction of 390 (range 222 to 563) (Carmichael, 1997).

Spring chinook salmon migrate as adults into the Grande Ronde Basin primarily from late May through July, with a peak migration period of June to early July (ODFW et. al, 1989). Spawning occurs from mid-August through mid-September. Juveniles emerge from the gravel in winter months (January through May) and typically rear in the system for their first year. Most juveniles begin their migration to the ocean from February into June of their second year, with a few leaving upriver rearing areas as subyearling fish from September through December (Jonasson et. al, Undated). Most Adults return to the basin after one to three years in the ocean (ODFW et. al, 1989; Knox, 1997; Lofy, 1998).

The three proposed adult collection facilities are located below most of the spring chinook salmon spawning areas in the respective streams. The juvenile acclimation and release facilities are generally centrally located in the middle of the major spring chinook salmon rearing areas. Spring chinook salmon rearing habitat is located both above and below alleach of these sites.

Summer steelhead are currently the most numerous adult anadromous fish in the Grand Ronde Basin. During the mid-1980s, escapement of all spawners to the basin was estimated at 11,000 fish (ODFW et al., 1989). Since then, the number has decreased substantially in the major tributaries (Chilcote, 1997). The more recent declining trend has contributed to the listing of the Snake River stock as threatened (Federal Register, August 18, 1997). Summer steelhead are present in the Upper Grande Ronde River, Catherine Creek, and the Lostine River.

Some adult summer steelhead enter the Grande Ronde River as early as July, but most enter from September through March. Spawning occurs from March to the end of May. Juvenile steelhead likely rear in each of these streams, typically spending two years as juveniles before outmigrating as smolts in April through June. However, some fall migration of juveniles occurs at lower river reaches prior to spring outmigration (ODFW et al., 1989). Although the percentage is low, (often less than 1 or 2 percent) adult steelhead may survive spawning and, again, migrate downstream to the ocean and return for a second spawning (Smith, 1997).

Bull trout are a native resident char present in the Grande Ronde Basin, and they are present in areas near the proposed facilities. The stocks in the Grande Ronde Basin are some of the healthiest in Oregon (Ratliff and Howell, 1992). However, the stocks in the tributaries of the Upper Grande Ronde River and in the Lostine River are considered at moderate risk of extinction. Catherine Creek stocks are in better condition and were categorized as "special concern" in 1992 (Ratliff and Howell, 1992), but they have recently been downgraded to "moderate risk" (Buchanan et. al., 1997). Bull trout spawn in the late summer and early fall (Ratliff and Howell, 1992), typically from September into early November (Underwood et al., 1995). Depending on their life history, they may spend their entire life in a small area near where they were spawned, or they may migrate from smaller tributary streams as juveniles to larger rivers and return to smaller streams as adults to spawn (Federal Register, June 13, 1997). Both forms of bull trout are likely present in the Grande Ronde Basin (Ballerud, 1998).

3.2.2 Potential Impacts of the Proposed Action Alternative

Captive broodstock and conventional supplementation approaches (see Figure 1) may prove to be helpful and important recovery measures, although captive broodstock techniques are still considered experimental. Accordingly, there are a variety of technical and policy issues (both general and stream-specific) surrounding the implementation of such approaches. With respect to the Proposed Action Alternative Captive Broodstock Project, the following four primary types of environmental issues related to fish population need to be considered: (1) the genetic benefits of the proposed program; (2) the genetic risks and hazards that it would pose; (3) project-specific issues relating to the effects of construction on the local environment; and (4) the effects of long-term operation of the proposed facilities.

As required by the ESA Section 10 permit modification (No. 1,011) issued June 20, 1997 (see Section 1), a long-term management plan for these and other potential fisheries-related environmental issues must be developed by March 1, 1998. This management plan will include a benefit/risk analysis, genetic management plan, adult collection plan, juvenile release plan, monitoring and evaluation plan, and a plan for disposition of any excess hatchery fish. The overall management plan will be prepared by ODFW, NPT, and CTUIR.

to maintain or increase natural production, and bBPA and others have previously addressed, in detail, the genetic and related issues surrounding captive broodstock and conventional supplementation programs. Both types of supplementation within the Columbia River Basin can have similar types, although different magnitudes, of genetic impacts. Applicable National Environmental Policy Act (NEPA) documents that address these issues include the Hood River Fisheries Project Environmental Impact Statement (EIS) (BPA, 1996a), the Yakima Fisheries Project EIS (BPA, 1996b), the Kootenai River White Sturgeon Project EA (BPA, 1997b), and the Lower Snake River Fall Chinook Initiatives EA (Corps of Engineers, 1996). These relevant impact assessments are incorporated by reference, and the contents of such are not reiterated in depth in this Preliminary EA.

BPA's Proposed Action Alternative is based on the conclusion by the federal, state, and tribal fisheries managers that the genetic risks of extinction outweigh those associated with intervention, as evidenced by the issuance in 1995 and 1997 of ESA Section 10 permits related to the proposed action (see Section 1.1.1). Similar conclusions were made in NPPC Fish and Wildlife Program documentation (BPA, 1997a). The areas of concern relative to genetic benefits and risks that were considered in planning the Proposed Action Alternative are summarized below.

Genetic Benefits

The captive broodstock component of the program/project (see Figure 1) is expected to reduce the chance for extinction by increasing the number of adult spring chinook salmon returning to the Grande Ronde Basin. About 500 naturally-produced parr would be collected for use as captive broodstock from each of the three streams (i.e., Upper Grande Ronde River, Catherine Creek, and the Lostine River). These collections would occur every year for a minimum of 5 years. Based on the estimated density of parr, projections are that about 10 percent of the naturally-produced parr would be collected annually from each stream for use as captive broodstock (Carmichael, 1996). The remaining approximately 90 percent would grow naturally in the streams and migrate as naturally-produced smolts to the ocean.

Survival of the captive broodstock is expected to greatly exceed that of naturally-produced fish. While the number of natural smolts in each of these streams may exceed 10,000 fish, the number of returning naturally-produced adults is expected to be extremely low in the future. Assuming a high smolt-to-returning adult survival rate of 0.4 percent (which is double the present survival rate of hatchery fish and may approximate current natural survival [Bryson, 1993]), and a winter parr-to-smolt survival rate of 28 percent (Carmichael, 1996), 500 naturally-produced parr collected from each stream (if left in the stream) would return less than one adult spring chinook salmon to the system each year. Therefore, the collection of the 500 parr for use as captive broodstock should have minimal effects.

In contrast, it is estimated that adults reared from parr using the captive broodstock approach could be used to produce up to 200,000 spring chinook salmon smolts per year for each of the three streams. The projected annual return from the release of these fish per stream increases from 15 to 230 adults per year between the years 2001 and 2009 with a full production goal of 150 spawning adults per stream annually (Carmichael, 1996).

Conventional supplementation is intended to complement the captive broodstock component of the program by providing an approach that should reduce genetic risks by decreasing the stages of the life cycle that are exposed to the artificial selection. For example, the initial goal in 1997 was to collect up to 66 adults from each of the three site streams. Returns were insufficient to meet this goal (Table 5). However, if 66 adults could have been collected from each stream, it is estimated that conventional supplementation could have been used to provide up to 100,000 smolts for release in each stream in 1999. If future returns increase, it may be possible to achieve comparable supplementation goals.

While the current number of naturally-produced smolt production per adult in the Grande Ronde Basin is not known, it is expected to be much less than can be achieved through conventional supplementation. Although the smolt-to-adult return ratio is less for hatchery-reared fish than natural smolts, it is anticipated that the total return per adult fish used in conventional supplementation would be higher than the total return from natural spawning adults. The net result would be a greater number of adult fish returning to spawn in the Grande Ronde Basin with the use of conventional supplementation compared to natural spawning by adults.

Genetic Effects

The potential genetic effects of using either the conventional supplementation or captive broodstock approaches to enhance naturally-produced stocks have been addressed in many research documents (Miller et al., 1990; Steward and Bjornn, 1990; Waples, 1991; Campton, 1995; Curren and Busack, 1995) and in the NEPA documents previously identified in this section.

Genetic hazards to fish stocks fit into four categories as defined by Curren and Busack (1995): (1) extinction; (2) domestication; (3) loss of within-population diversity; and (4) loss of between-population diversity. The chance that any of these forms of genetic hazard could occur is considered genetic risk. The Proposed Action Alternative would increase the risk of genetic hazard resulting from domestication, but it should reduce the otherwise distinct possibilities of extinction or subsequent losses in diversity.

Extinction: Genetic effects and their risks have been evaluated by federal, state, and tribal fisheries managers (i.e., ODFW, NMFS, CTUIR, and NPT). They have determined that the Proposed Action Alternative is likely to provide overall benefits to the Grande Ronde Basin spring chinook salmon because there is a greater chance of extinction or other negative genetic effects under the No Action Alternative (Carmichael, 1996).

Domestication:

Even the best hatchery practices might alter future genetics through a process called domestication, which could be a problem with all types of supplementation. The selection process in a hatchery is different than that in the wild. As Waples (1991) suggested in his evaluation of interaction of hatchery and naturally-produced fish, that unless delayed selection (i.e., that which occurs after fish are released into the wild) removes the genotypes in the same proportion to those that would naturally have been removed earlier, the hatchery fish would not be genetically equivalent to their natural counterparts. For captive broodstock, there may be a higher risk of domestication than with conventional supplementation because of the higher number of life stages in captivity.

The degree to which hatchery practices for either the captive broodstock or the conventional supplementation components of the proposed program might influence the future characteristics of the Grande Ronde Basin stocks is unknown. If adverse characteristics are developed in the hatchery process, they could be transferred to the remaining natural populations in these streams. However, the increased risk of domestication is preferable when the risk of extinction of a stock is high (Curren and Busack, 1995). In addition, operating plans for captive broodstock projects similar to the proposed program already exist (Carmichael et al., 1997). These plans prescribe current hatchery management practices designed to minimize the risk of domestication when possible. For example, in order to reduce genetic risk, conventional hatchery techniques will be used when sufficient adults are available. Conventional supplementation or natural spawning will eventually supplant captive broodstock when the risk of extinction is sufficiently low. A similar plan will be utilized for the Proposed Action Alternative.

Loss of Within-Population Diversity: Diversity is needed to provide a population of organisms with the ability to respond and survive under a range of environmental conditions. Loss of diversity within a population is the result of loss of variety and different gene combinations within the specific stream stock (e.g., the Lostine River). This loss is likely to be greater for captive broodstock than for conventional supplementation (Curren et al., 1996) because artificial selection occurs over a longer period of the life cycle. Diversity can also decrease in natural populations if the numbers of fish are at extremely low levels. For example, the lowest diversity would be anticipated in a population with only one spawning pair.

The limited number of naturally-produced fish stock that would be collected (less than 500 parr per year or 66 adults) for captive broodstock and conventional supplementation, along with the already limited gene variety within these fish (because of extremely low numbers of stock), will contribute to low within-population diversity. Natural spawning of future offspring of these fish could result in reduced diversity within their respective release streams because low adult numbers are less likely to reflect the same level of diversity than was present in the juveniles. Several actions would be taken to reduce this effect.

For captive broodstock, fish will be collected over 5 different years with some fish from the same year maturing during different years. Spawning protocols (Integrated Hatchery Operations Team, 1994) require crossing of different brood years, thereby increasing the diversity of crosses within the captive broodstock component of the program. The use of conventional supplementation will also increase diversity because it will utilize adults whose progeny are not used in the captive broodstock program. In addition, conventional supplementation exposes fish to artificial selection for a shorter portion of the life cycle, thus reducing loss of diversity through artificial selection. Since this portion of the Proposed Action Alternative will be implemented only when stock escapement is high, the offspring from these stocks will spawn with a usually more abundant returning natural stock, thus reducing the within-population genetic loss of diversity.

In addition, the number of returning captive broodstock or conventional supplementation fish allowed to spawn within a stream can be controlled at the adult collection facilities on each of the streams. If a disproportionate number of adults from some groups or a high number of naturally-produced fish return, some of the non-natural adults can be removed at the weir, thereby increasing control of diversity of the spawning stock within the stream. The result is anticipated to reduce the chance that within-population diversity would become a problem within each of these streams.

Loss of Between-Population Diversity: This loss of diversity is the result of loss of differences in genetic makeup between different stocks or populations. Loss of genetic diversity within or between populations can result from straying of stocks from one stream system to another and spawning in high relative numbers, to the point of reducing the genetic differences between these stocks. If the genetic factors lost from crossing of these stocks are adaptive to the specific stream, their loss can have significant effects on the viability of future generations in the stream into which straying has occurred. This could also result from selection in a hatchery environment where resulting smolts are more like each other than their parents were as juveniles (e.g., for captive broodstock).

Loss of between-population diversity is likely to be a minor concern under the Proposed Action Alternative project. Curren's (Curren et. al., 1996) evaluation of considered actions for the Grande Ronde Basin indicated that this type of risk was lower for conventional supplementation than a combination of the two types of supplementation discussed here. The extended acclimation of juveniles to be released into each of the three streams is intended to increase the chance of adult "homing" to the stream in which they are released as smolts. Fish released will be marked so that the detection of straying can be determined. Monitoring at weirs on the release streams and at several other locations in the sub-basin should help indicate if straying is a problem and allow for adjustments, such as the removal of straying fish before they can adversely affect between-population diversity.

Construction Effects

Construction of the adult collection and juvenile acclimation and release facilities could have potential short-term effects on local aquatic systems because of sediment and habitat disturbance. The addition of fine sediment to streams can reduce egg survival in spawning areas and reduce benthic aquatic insect survival by covering the streambed. Benthic algae production could be reduced by increased sediment and **turbidity**. Of greatest concern would be increased sediment in spawning areas for salmon, steelhead, and resident trout. This is of special concern for the Upper Grande Ronde River, where stream sediment loads and substrate concentrations are already high.

Several actions will be taken to minimize the effect of the proposed construction. First, instream construction would occur primarily in July and early August when spawning or egg incubation of any salmonid is not expected. Standard best management practices (e.g., hay bales, minimizing equipment use in the stream, silt curtains) would be employed to minimize runoff of sediment to the stream. Instream construction for all three acclimation sites would be limited to the water intake and discharge locations. It is expected that streambank disturbance would be less than 3.3 linear meters (10 feet) at all sites (Montgomery Watson, 1997).

Construction of Although the design for the adult collection facilities would result in minimal has not been completed, streambank disturbance for these facilities would also be minimal. One Two of the facilities (Catherine Creek and Lostine River) would be located at the site of existing fish passage or water diversion structures. Some bank disturbance would occur, but most of the construction activity would be behind existing hard material (cement or riprap); therefore, so chance of sediment input would likely be minimal. Picket weirs would be added to existing structures, so minimal streambed bottom disturbance would occur at this site.

Use of the existing portable weir and trap system is the preferred option for collection of adults at the Lostine River site (see Section 2.1.1). Therefore, minimal instream or bank disturbance is anticipated.

Construction of the Upper Grande Ronde River adult collection facility could involve bank disturbance, as there are no existing facilities in place. This site may require the instream construction of stream bank cement abutments and adult trapping and holding facilities. Additionally, rock flow control weirs made from rocks may be placed in the streams across the stream bottomwidth of the stream channel. These actions of a cement pad, which would result in more sediment disturbance and likely increased resuspension of fine materials in the streambed. However, because of timing restrictions on instream construction, with most work occurring during low flow periods, and because best management practices would be used during construction, impacts to the stream biota would be minimal.

Operation Effects

Once installed, the proposed juvenile acclimation and release and adult collection facilities would be checked daily, with personnel remaining on site throughout the period of operation. Operation of the facilities has the potential for the following direct and indirect effects on the aquatic ecosystem (including potential effects on native naturally-produced spring chinook salmon, steelhead, fall chinook salmon, resident fish, and other aquatic resources):

- **competition** for food,
- introduction of disease,
- predation,
- effluent discharge (addressed in Section 3.1.2),
- fish entrainment and impingement,
- delayed migration,
- fish transport stress, and
- potential upstream and downstream redistribution of spawners.

The release of hatchery-reared smolts annually to each of the three streams has the potential to increase competition for limited food resources with both natural spring chinook salmon stocks and with different species (the exact number will be identified by ODFW in the long-term management plan required for the ESA

Section 10 permit, [see Section 2.1.3]). Current estimates of naturally-produced spring chinook salmon parr in each site stream are less than 30,000, which would represent less than 10,000 outmigrating smolts considering over winter mortality rates (Carmichael, 1996). Thus, the addition of hatchery smolts (up to 200,000 in each site stream) could be a very large addition to the existing naturally-produced juvenile stocks.

The greatest potential for food competition would likely occur in the smaller headwater areas. To minimize competition in these areas, smolts would be held in the acclimation and release facilities until they are considered ready to rapidly outmigrate. At this time, the smolts would be allowed to exit volitionally. After some period of time, those remaining would be flushed from the raceways acclimation tanks. These

Because fish released will be of hatchery origin, their migration rate is expected to be more similar to that of other hatchery fish than to naturally-produced fish in the Grande Ronde Basin (Lofy, 1998). The rate is therefore likely to be similar to spring chinook salmon from the Lookingglass Hatchery, which rapidly migrate out of the system, typically arriving at Lower Granite Dam in about 14 to 21 days (Fish Passage Center, 1993 and 1994). While the large number of spring chinook released may cause some reduction of local headwater stream food sources, the rapid migration of these fish would result in these effects being only minor to naturally-produced spring chinook salmon and other fish species because of their short period of residence in the stream. Historically, naturally-produced spring chinook salmon smolts have been present along the migration corridors (Grande Ronde River to the Pacific Ocean) and compete with other spring chinook salmon and naturally-produced stocks (e.g., steelhead, bull trout), so Therefore, the introduction of released smolts would be a short term effect, but would not constitute an abnormally competitive situation over the long term.

Spring chinook salmon released from the juvenile acclimation and release facilities would comprise a small portion of the total number of juvenile anadromous fish present in the Snake and Columbia Rivers. NMFS (1995a) has restricted the number of hatchery fish released annually within the Columbia River Basin (197.4 million fish) and Snake River Basin (20.2 million) to ensure that listed stocks would not likely be adversely affected by these releases. The numbers of fish released from the proposed facilities (in addition to those released from all other Columbia Basin hatcheries) would remain within these basin-wide limits and, therefore, would not cause impacts to listed stocks within the Columbia River/ and Snake River migration corridor.

The transfer of fish from a hatchery environment, where diseased fish are less likely to die, to the natural environment increases the chance of pathogen transmission to the collected fish and back to the natural stocks. The infectious diseases that could occur include bacterial kidney disease (BKD), erythrocytic inclusion body syndrome (EIBS), bacterial cold water disease (CWD), enteric redmouth disease (ERM), bacterial gill disease (BGD), furunculosis, columnaris, and infectious hematopoietic necrosis (IHN), as well as fungus and external parasites. (Note: a pathogen may be present, but not at levels that cause disease.)

Since there is no reliable non-lethal method of determining the level of a pathogen in fish, a monitoring plan has been developed for programs similar to the Proposed Action Alternative. This plan is designed to reduce the risk of fish disease being transmitted within captive broodstocks or being transmitted to naturally-produced stocks (Carmichael, 1996). The plan includes the most recent disease-control protocols, including low rearing densities, daily observation, and when necessary, removal of individuals to prevent the spread of disease both within the group and ultimately to naturally-produced stocks. The existing plan will be modified, as appropriate, and incorporated into the long-term management plan required under the current ESA Section 10 permit (see Section 2.1.3).

Predation by introduced fish on native spring chinook salmon or other fish is likely to be minor. Fish size plays a major role in fish predation, as small fish are unlikely to be predatory on other fish unless the size difference is large (Hillman and Mullan, 1989). Juvenile spring chinook salmon in streams feed primarily on insects (Wydoski and Whitney, 1979). Their small size precludes the possibility of predation on all but the smallest fish, and juvenile spring chinook salmon rarely consume fish while in freshwater (Scott and Crossman, 1973; Muir and Coley, 1996). Because of their small size and preference for insects, incidental predation on resident or other anadromous stocks would likely be minimal.

The chances of entrainment or impingement of naturally-produced fish at any of the acclimation and release facilities would be eliminated by having water intakes with currently required maximum screen openings of 0.2 centimeter (0.079 inch) and maximum approach velocities of 0.13 m/s (0.4 fps) to protect juvenile salmonid fry. The adult water intakes for the adult collection facilities would have openings large enough to allow smolts to pass directly through the facilities so that impingement or entrainment would not occur.

The adult collection facilities are designed to minimize delay of migrating fish that encounter the facility and to reduce the chance of impingement of migrating post-spawned adult steelhead or large trout (e.g., bull trout). Other than one well-decayed bull trout found on the Upper Grande Ronde River picket weir, no large steelhead or bull trout were observed in or near the trapping operations during 1997. (However, these traps were installed later in 1997 than would be typical under the Proposed Action Alternative. Earlier and longer placement of traps might involve more fish encountering the weirs.) The facilities will be staffed on a 24-hour basis during operation, and weirs would be checked on a daily basis (or more frequently). Therefore, fish that do have trouble migrating past the weirs could be physically removed and allowed to pass downstream (or upstream).

During high water events, pickets may be removed to facilitate downstream passage. Additionally, the picket portions of the weirs are designed for rapid collapse or section removal, which would allow on-site personnel to provide quick downstream or upstream access routes for any fish observed near the weir. While some adult capture facilities used in other supplementation programs in the Pacific Northwest have not completely eliminated all problems with fish passage and collection, in many cases, problems encountered have been corrected and these facilities have remained in operation (Bugert, 1998). It is anticipated that the actions currently planned will help eliminate any major passage and collection problem and help provide a mechanism to make any needed alterations at these sites, if major problems are observed.

Juveniles and adults would be handled and transported using established practices to minimize stress and mortality. Juveniles would be shipped at low densities, and a water-to-water fish transfer would be used at the acclimation tanks. Transported adult fish have the potential to be stressed, especially late in the collection period when river temperatures can be high (see Section 3.1). However, these fish would be collected daily when present. and, dDuring warm periods, collection would be made in the morning when water temperatures are coolest.

All ten spring chinook salmon transported during 1997 (see Table 6) arrived in good condition at the Lookingglass Hatchery. This suggests that current plans should be suitable to protect adult fish during holding and transport. For example, similar spring chinook salmon adult collection and transport procedures have occurred in the Imnaha River with only incidental adult mortality (probably less than 1 percent) (Phelps, 1997). However, warmer water temperatures may be found in the Grande Ronde River during some of the collection period. This could result in the survival rates during transport being slightly lower than those found during collection efforts on the Imnaha River.

Steelhead and Bull Trout

Effects of the Proposed Action Alternative on steelhead and bull trout are likely to be minor and in some ways may be beneficial. Competition for food resources within the Grande Ronde River or farther downstream with resident bull trout and anadromous steelhead is expected to be slight. However, if the Proposed Action Alternative is successful, increased numbers of juvenile spring chinook salmon could compete with these species. As already discussed, this is due to the rapid

outmigration of released spring chinook salmon and the fact that the number of spring chinook salmon in the Snake and Columbia River/Snake River migration corridor would not be increased markedly from present levels.

The small size of outmigrating spring chinook salmon smolts and their feeding characteristics will result in a very low chance of predation on bull trout or steelhead fry. The increased number of outmigrating smolts may briefly benefit larger bull trout in the Grande Ronde Basin by directly increasing a the food supply; bull trout feed primarily on other fish and will prey on spring chinook salmon smolts.

The adult collection facilities might have some effects onto bull trout and steelhead. However, operations of the three temporary weirs during 1997 did not result in any problems with steelhead or bull trout. The adult collection facilities would be designed to allow sorting of fish so that bull trout or steelhead could be sorted from the remaining spring chinook salmon and passed downstream (or upstream).

The fish most likely to be adversely affected by the adult collection facilities would be downstream migrating, weakened adult steelhead that have completed spawning. These fish could drift into the picket weirs and become impinged. If some steelhead were to suffer mortality in this manner, the effect on the naturally-produced population would be slight. The current repeat spawner rate is probably less than 2 percent; this additional loss of post-spawning adult steelhead would therefore have very slight effects on future spawning stock in the Grande Ronde Basin. The large picket openings in the facility will allow juvenile steelhead and bull trout would be able to pass downstream through both the weir and the adult holding facility. Because the weirs would be installed after most spring steelhead smolt outmigration has occurred, there is a very low chance that steelhead smolts would encounter these facilities.

3.2.3 Potential Impacts of No Action Alternative

The federal, state, and tribal fisheries managers believe that without implementation of the Proposed Action Alternative, spring chinook salmon in the Grande Ronde Basin are likely to become extinct in the near future. The precipitous decline in the number of spring chinook salmon redds in the basin appears to confirm this prediction. Consequently, the No Action AlternativeNo Action alternative has the greatest overall risk to the local spring chinook salmon genetic resources.

Conversely, the No Action Alternative would not present the hazard of domestication that applies to the Proposed Action Alternative. In addition, the No Action AlternativeNo Action alternative would eliminate the chance of introducing fish diseases from other river systems. However, many of the diseases of concern (e.g., BKD and fungus) are already found in endemic spring chinook salmon within natural stocks (Elliott and Pascho, 1993), so the potential for disease might still be present with the No Action Alternative, although the probability of a disease epidemic would probably be low.

The direct and indirect construction and operation effects on the aquatic ecosystem described in Section 3.2.2 would not occur under the No Action AlternativeNo Action alternative.

3.3 Vegetation

3.3.1 Existing Environment

The following sections describe the existing vegetation (including wetlands and endangered and threatened plant species) at the proposed Upper Grande Ronde River, Catherine Creek, and Lostine River adult collection and juvenile acclimation and release sites. This information is based on (1) a site visits conducted on January 23 and 24 and September 9 and 10, 1997 by representatives from BPA, the ODFW, and/or BPA's environmental contractors; (2) aerial photographs, and maps; (3) consultations with U.S. Fish and Wildlife Service (USFWS), USFS, and ODFW; and (4) existing literature.

All six sites are located in riparian areas. Surveys for wetlands were conducted within or near the construction limits of all six sites on September 9 and 10, 1997, and very small (about 0.04 hectares or 0.1 acre at each site) palustrine-emergent wetlands were found at three sites. Maps of these wetlands are presented in Section 6.0 of Appendix A. Because the two Upper Grande Ronde River sites are located on USFS lands, surveys for USFS sensitive and other rare plant species detectable during the fall survey period were conducted at these two sites on September 9, 1997; however, no sensitive or rare plant species were found. This information did not indicate the presence of wetlands of distinguishable size at any of the sites except possibly the Lostine adult collection Site A; however, snow cover prevented field determination of wetland occurrence during the site visit. Wetlands were not evident at the Catherine Creek adult collection facility site, where snow cover was minimal during the site visit. All sites would be inspected for wetlands prior to construction

Upper Grande Ronde River

The proposed proposed adult collection site occupies about 0.4 hectare (1.0 acre) of USFS lands is located within and adjacent to the Upper Grande Ronde River, just downstream from the USFS River Campground on the west bank of the river. The site is moderately sloped and covered with mostly young 2.5- to 4-meter (8- to 12- foot) high lodgepole pine (*Pinus contorta*) mixed conifer trees. Other tree species at the site include Engelmann spruce (*Picea engelmannii*), ponderosa pine (*Pinus ponderosa*), cottonwood (*Populus balsamifera* ssp *trichocarpa*), and alder (*Alnus incana*). Riparian shrub vegetation (including red osier dogwood [*Cornus stolonifera*], alder, and willow [*Salix* sp.]) is sparsely distributed, primarily along the west river east river bank. A small (about 0.03 hectare [0.08 acre]) palustrine-emergent wetland overlaps the project boundary at the northern edge of the site near a small unnamed creek that flows into the Upper Grande Ronde River. Approximately 0.2 hectare (0.04 acre) of this wetland is located within the project boundary. Plant species associated with this wetland include reed canary grass (*Phalaris arundinacea*), scouring rush (*Equisetum hyemale*), water sedge (*Carex aquatilis*), and Sitka burnet (*Sanguisorba sitchensis*).

The proposed juvenile acclimation and release facility site occupies about 0.3 hectare (0.7 acre) at an undeveloped campground on USFS lands between the Upper Grande Ronde River and USFS Road 5125. Vegetation on and surrounding the site generally consists of mixed-conifer forest typical of the Blue Mountains (USFS, 1979 and 1994a). Forest at the site is interspersed with scattered stumps and small clearings. Tree species are of mixed age (including mature) and include grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine, lodgepole pine, and Engelmann spruce. A sparse, narrow (about 3.3-meter [10-foot] wide) band of shrubs typical of the region (primarily red osier dogwood [USFS, 1979]) borders the river. Grazing occurs on nearby private lands. No wetlands occur in areas that would be affected by the proposed facility's construction or operation.

Catherine Creek

The proposed adult collection site occupies approximately 0.04 hectare (0.125 acre)s located within and adjacent to an existing fishway and water supply diversion on Catherine Creek. Vegetation adjacent to the creek has been highly disturbed by grazing and the construction of a gravel access road, diversion structures, and access to the fishway. There is little to no riparian shrub vegetation along either side of the fishway. A narrow (about 3-meter [15-foot] wide) riparian corridor consisting primarily of deciduous trees and shrubs (e.g., cottonwood, willow, hawthorn [*Crataegus douglasii*], red osier dogwood) occurs on the moderately steep creek banks upstream and downstream from the fish ladder. Surrounding vegetation consists of pastures and agricultural land with scattered

ponderosa pine. No wetlands occur in areas that would be affected by the proposed facility’s construction or operation.

The proposed juvenile acclimation and release site occupies about 0.2 hectare (0.51.2 acre)s of a narrow, partially cleared area between Catherine Creek and a steep slope with scattered rock outcrops. A dirt access road and fence line runs through the site along the creek, and a small trailer residence is located across the creek. Vegetation is typical of riparian areas of the region (USFS, 1979) and includes scattered mature ponderosa pine and a narrow 4- to 7-meter (15- to 20-foot) wide shrub corridor (e.g., red osier dogwood, willow, hawthorn, and wild rose [*Rosa woodsii*]). Ponderosa pines are scattered on the bordering slope. A small (about 0.02 hectare [0.06 acre]) palustrine-emergent wetland overlaps the project boundary. Approximately 0.01 hectare (0.03 acre) of this wetland is located within the project boundary in the middle of the site between the river and the slope and overlaps a portion of the existing dirt road. Plant species associated with this wetland include meadow buttercup (*Ranunculus acris*), Bebb’s sedge (*Carex bebbii*), and small-flowered bulrush (*Scirpus microcarpus*). The area is used for grazing.

Lostine River

The proposed adult collection site occupies about 0.5 hectare (1.3 acres) within and adjacent to an existing temporary weir and fish trap location on the Lostine River. An existing gravel access road and parking area and a small trailer are at the site. Much of the east bank of the river at the site consists of riprap or gravel bar. Scattered clusters of 4- to 7-meter (12- to 24-foot) high cottonwoods interspersed by grass or shrub (e.g., willow) areas occur on both sides of the river. No wetlands occur in areas that would be affected by the proposed facility’s construction or operation.

The proposed Lostine River juvenile acclimation and release site occupies about 0.5 hectare (1.32.6 acres) of a disturbed, grazed, grassy clearing adjacent to the Lostine River. A narrow 3- to 5-meter (10- to 15-foot) wide riparian corridor with mostly shrubby vegetation (e.g., hawthorn, alder) and a few scattered spruce and ponderosa pine trees typical of the region (USFS, 1994b) occur between the site and the river. A thin band of young and mature ponderosa pine and an access road border the sloping upland side of the site. Surrounding vegetation consists of pastoral and agricultural lands. A small (about 0.4 hectare [0.9 acre]) palustrine-emergent pastoral wetland overlaps the central grassy area of the site between the river and a steep, abrupt slope. Approximately 0.06 hectare (0.16 acre) of this wetland is located within the project boundary. Plant species associated with this wetland include small-flowered bulrush, common rush (*Juncus effusus*), and common horsetail (*Equisetum arvense*). The wetland has been regularly disturbed by grazing. Disturbed, grazed, pastoral wetlands may occur at the site, but could not be confirmed because snow covered the ground during the January 24, 1997 site visit.

Adult collection site A occupies about 1.2 acres within and adjacent to an existing fish ladder/irrigation diversion on the Lostine River at Wynans Trout Farm. The adjacent streambanks are riprapped, with minimal riparian shrub vegetation along either side of the fish ladder. Dirt roads border both sides of the river. A narrow (about 15 feet wide) steep riparian corridor, consisting of deciduous trees up to about 80 feet tall and shrubs (e.g., cottonwood, alder, willow, hawthorn), occurs along the river banks upstream and downstream from the fish ladder, with scattered juniper and ponderosa pine. A small wetland may occur in a depression situated between the access road and the riprapped bank near the fish ladder. Surrounding vegetation consists of pastures and agricultural land.

Adult collection site B occupies about 1 to 2 acres within and adjacent to two existing irrigation diversions on the Lostine River, the Cross-Country Ditch and the Miles Ditch. The adjacent streambanks are abrupt and steeply cut with minimal, disturbed riparian shrub vegetation occurring along either side of the channel and diversions. Nearby riparian vegetation is similar to the site described above, and pastures and agricultural land surround the site.

Endangered and Threatened Species

No federally-listed or state-listed threatened or endangered plant species are known or suspected to occur at or in the vicinity of the project sites (USFWS, 1997; Oregon Natural Heritage Program [ONHP], 1997). However, one federal candidate and nine federal species of concern may occur in the vicinity of all or some of the sites (ONHP, 1997; USFWS, 1997) (see Table 57). Three USFS sensitive species of plants (one of which is also a Federal species of concern) may occur in the vicinity of the Upper Grande Ronde sites (USFS, 1997). The ONHP (1997) has no record of any endangered, threatened, or rare plant species occurring on any of the sites.; however, tThree observations of three USFS sensitive plant species, gray moonwort (*Botrychium minganense*), mountain grape-fern (*B. montanum*), and ground cedar (*Diaphasiatrum complanatum* [*Lycopodium complanatum*]), have been recorded within 1.6 to 4.8 kilometers (1 to 3 miles) of the Upper Grande Ronde River sites (ONHP, 1997; USFS, 1997).

Because the two Upper Grande Ronde River sites occur on USFS lands and provide potentially suitable habitat, surveys for these observed and other USFS sensitive or rare species of plants that could be detected during the survey period were conducted at these two sites on September 9, 1997. The surveys consisted of thorough ground searches of all areas that could be potentially disturbed by facility construction or operation. No sensitive or rare plant species were found.

3.3.2 Potential Impacts of Proposed Action Alternative

Potential effects of the Proposed Action Alternative on vegetation would include permanent removal or temporary disturbance of vegetation for construction and operation of the six proposed facilities (see Figure 2). Permanent removal of vegetation would be required for installation of project features, such as the acclimation tanks, access roads, parking lots, and trailer pads (see Section 2 for a detailed description of these features). Temporary disturbance of

Table 7. Listing Status of Species Known or Suspected Near Some or All of the Six Proposed Facility Sites

Table 7. Listing Status of Species Known or Suspected Near Some or All of the Six Proposed Facility Sites^{1/}

Common Name	Scientific Name	Federal Status ^{2/}	State Status ^{3/}
Plants			
Howell’s spectacular thelypody	<i>Thelypodium howellii</i> var. <i>spectabilis</i>	C	E
Upward-lobbed moonwort	<i>Botrychium ascendens</i>	SOC, S	C

Crenulate grape-fern	<i>B. crenulatum</i>	SOC	C
Skinny moonwort	<i>B. lineare</i>	SOC	C
Twin-spike moonwort	<i>B. paradoxum</i>	SOC	C
Stalked moonwort	<i>B. pedunculosum</i>	SOC	C
Gray moonwort	<i>B. minganense</i>	S	--
Mountain grape-fern	<i>B. montanum</i>	S	--
Long-haired mariposa-lily	<i>Calochortus longebarbatus</i> var. <i>Longebarbatus</i>	SOC	--
Fraternal paintbrush	<i>Castilleja fraterna</i>	SOC	--
Clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	SOC	C
Oregon semaphore grass	<i>Pleuropogon oregonus</i>	SOC	C
Ground cedar	<i>Diaphasiatum complanatum</i> (<i>Lycopodium</i> c.)	S	--
Fish			
Chinook salmon (spring/summer runs)	<i>Oncorhynchus tshawytscha</i>	T	T
Steelhead (Snake River Basin)	<i>O. mykiss</i>	T	--
Interior redband trout	<i>O. m. gibbsi</i>	SOC, S	--
Bull trout	<i>Salvelinus confluentus</i>	C	C
Pacific lamprey	<i>Lampetra tridentata</i>	SOC	SV
Invertebrates			
Blue Mountains cryptochian caddisfly	<i>Cryptochia neosa</i>	SOC	--
Birds			
Peregrine falcon	<i>Falco peregrinus</i>	E	E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T
Northern goshawk	<i>Accipiter gentilis</i>	SOC	C
Ferruginous hawk	<i>Buteo regalis</i>	SOC	C
Olive-sided flycatcher	<i>Contopus borealis</i>	SOC	--
Amphibians and Reptiles			
Columbia spotted frog	<i>Rana luteiventris</i>	C	--
Mammals			
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SOC	SV
California wolverine	<i>Gulo gulo luteus</i>	SOC	T
Small-footed myotis	<i>Myotis ciliolabrum</i>	SOC	SU
Long-eared myotis	<i>M. evotis</i>	SOC	SU
Fringed-myotis	<i>M. thysanodes</i>	SOC	SV
Long-legged myotis	<i>M. volans</i>	SOC	SU
Yuma myotis	<i>M. yumanensis</i>	SOC	SU
Pale western big-eared bat	<i>Plecotus townsendii pallascens</i>	SOC	SC
Pacific western big-eared bat	<i>P. townsendii</i> .	SOC	SC
Preble's shrew	<i>Sorex preblei</i>	SOC, S	--

1/ Sources: USFWS (1997); ONHP (1997); USFS (1997).

2/ E = Endangered, T = Threatened, C = Candidate, S = USFS Sensitive, SOC = Species of Concern. USFS sensitive status indicated only for the two sites on USFS land (the Upper Grande Ronde River sites) as identified in USFS (1997).

3/ E = Endangered, T = Threatened, C = Candidate, SC = Sensitive-Critical, SV = Sensitive-Vulnerable, SU = Sensitive Undetermined.

vegetation would occur primarily from pedestrian or vehicular access to the sites and the storage of building materials during the construction period. The estimated maximum acreage of vegetation types permanently or temporarily affected by facility construction and operation at the six sites is presented in Table 68.

A total of approximately 0.04 hectare (0.1 acre) of palustrine-emergent wetlands would be permanently affected and 0.04 hectare (0.1 acre) would be temporarily affected by the project at the Upper Grande Ronde River adult collection site, the Catherine Creek juvenile acclimation and release site, and the Lostine River juvenile acclimation and release site (Table 68). Up to three trees with a greater than 53-centimeter (21-inch) dbh (ponderosa pine trees measuring 63, 80, and 86 centimeters [24.8, 31.5, and 34.0 inches] dbh) would be removed at the Catherine Creek juvenile acclimation and release site during project construction. The proposed facilities have been/would be planned in or near existing clearings or access roads to minimize disturbance and removal of vegetation to the maximum extent practicable. In particular, removal or disturbance of trees and wetlands would be avoided when possible.

No site-specific plant surveys have been conducted at the proposed Upper Grande Ronde River sites (USFS 1997). Installation and operation of the Upper Grande Ronde River adult collection facility would affect a total of approximately 0.4 hectare (1.0 acre) of vegetation, including permanent clearing of about 0.04 hectare (0.1 acre) and temporary disturbance of about 0.3 hectare (0.8 acre) of shrub and early seral (conifer trees 2 to 4 meters [8 to 12 feet] high) vegetation (Table 7). seral vegetation (less than 1 acre) at the Upper Grande Ronde River adult collection site for construction of an off-channel holding area, an access road and a concrete or gravel pad for a 2-person staff trailer. No trees greater than 6 inches in diameter would be removed at this site. The Catherine Creek and Lostine River adult collection facilities are not expected to adversely affect vegetation, given the extent of existing clearing and disturbed vegetation at these sites. These sites are characterized by existing irrigation diversions, fish ladders, and/or riprap, access roads, or previously disturbed minimal vegetation. No trees and less than 0.3 hectare (0.81 acre) of disturbed herbaceous or shrubby vegetation would be removed or disturbed at each of these sites (Table 7).

No trees greater than 53 centimeters (21 inches) in dbh would be removed at the Upper Grande Ronde River juvenile acclimation and release site. No trees would be removed for the Lostine River juvenile acclimation and release facility. Minimal amounts of grass, riparian shrub, and/or forest understory vegetation would be permanently removed or temporarily disturbed for construction and operation of the juvenile acclimation facilities at the three juvenile acclimation and release facilities (Table 86). Permanent effects would be related primarily to installation of up to four acclimation tanks, a parking area, a temporary trailer residence, and an access road at each site. Approximately 65 lineal feet of riparian shrub vegetation (totaling approximately 650 square feet) would potentially be disturbed at each juvenile acclimation site by project construction for installation of drain and fish release pipes, and gravity water intake structures; less than approximately 10 lineal feet of this riparian area would be permanently disturbed at each site to accommodate these structures. Less than approximately 1 acre of herbaceous, shrubby or early seral (trees less than 8 inches in diameter) would be temporarily or permanently disturbed at each of the three sites. Clearing effects (excluding existing roads) on vegetation would likely be least at the Upper Grande Ronde River and Catherine Creek juvenile acclimation and release sites, Lostine River site, followed by the Catherine Creek site and Lostine River juvenile acclimation and release site (Table 86). (these sites are already almost completely or partially cleared, respectively; see Section 3.3.1). Cumulative effects on vegetation would be minimal due to the small, localized, and/or temporary nature of facility construction and operation.

Table 8. Estimated Acres of Vegetation Affected by Program Activities at the Six Proposed Facility Sites

Table 8. Estimated Acres^{1/} of Vegetation Affected by Program Activities at the Six Proposed Facility Sites

	Palustrine-Emergent Wetlands ^{2/}		Grass		Shrub/ Early Seral		Shrub/ Deciduous Forest	Open Coniferous Forest		Existing Road	Totals ^{9/}		Grand Totals ^{9/}
	T ^{3/}	P ^{4/}	T ^{3/}	P ^{4/}	T ^{3/}	P ^{4/}	T ^{3/}	T ^{3/}	P ^{4/}	P ^{4/}	T ^{3/}	P ^{4/}	T ^{3/} and P ^{4/}
Upper Grande Ronde River Adult Site	<0.1	0	0	0	0.8 ^{5/}	0.1 ^{5/}	0	0	0	0	0.9	0.1	1.0
Upper Grande Ronde River Juvenile Site	0	0	0	0	0	0	0	0.1 ^{6/}	0.2 ^{6/}	0.4	0.1	0.6	0.7
Catherine Creek Adult Site	0	0	<0.1	<0.1	0	0	0	0	0	0	<0.1	<0.1	0.1
Catherine Creek Juvenile Site	<0.1	<0.1	0	0	0.2	0	0.1 ^{7/}	0	0	0.2	0.2	0.3	0.5
Lostine River Adult Site	0	0	0.5	<0.1	0	0	0.3 ^{8/}	0	0	0.5	0.8	0.5	1.3
Lostine River Juvenile Site	<0.1	0.1	0.8	0.1	<0.1	0	0	0	0	0.2	0.9	0.4	1.3
TOTALS ^{9/}	0.1	0.1	1.3	0.2	1.1	0.2	0.3	0.1	0.2	1.3	3.0	1.9	4.9

1. 1 acre = 0.4 hectare
2. All palustrine-emergent wetlands
3. T = Acreage Temporarily Affected
4. P = Acreage Permanently Affected
5. Includes 2-4 m (8 to 12-ft) high lodgepole pines
6. No trees ≥ 53 cm (21 in) dbh removed
7. Up to 3 trees ≥ 53 cm (21 in) dbh removed as described in text
8. No trees removed
9. Due to small areas, values are approximate

Endangered and Threatened Species

Ground-disturbing activities at the Upper Grande Ronde River sites in suitable habitat could potentially affect three USFS-sensitive species known or suspected to

occur in the vicinity of these sites, should they actually occur at the sites. Ground-disturbing activities in suitable habitat could potentially affect the one federal candidate species of also state-listed as endangered (Howell's spectacular thelypody) plant, Howell's thelypody (*Thelypodium howelli* var. *spectabilis*), that may occur in the vicinity of four of the project sites (it was not found during plant surveys at the two Upper Grande Ronde River sites). This plant is associated with river valleys and moist (usually alkaline) plains (Hitchcock et al., 1990). Although no USFS sensitive or other rare plant species were found during plant surveys at the two Upper Grande Ronde River sites, potentially suitable habitat for such species would be disturbed or removed by facility construction or operation at five of the six proposed sites as described above. Thus, the Proposed Action Alternative may impact individuals or habitat of such species, but it will likely not contribute to a trend towards federal listing or cause a loss of viability to the population or species and thus could potentially be affected by ground-disturbing project activities within potential habitat.

3.3.3 Potential Impacts of No Action Alternative

Under the No Action Alternative, no disturbance or removal of vegetation resources, including endangered or threatened plant species, would occur as a result of construction or operation of the proposed adult collection and juvenile acclimation and release facilities. The potential for future disturbance of these sites from other sources appears to be low based on the existing uses and the expected future management of these sites.

3.4 Wildlife

3.4.1 Existing Environment

Wildlife expected to occur in the vicinity of the six sites are those associated with the primary habitat types present, as described in Section 3.3. In general, riparian habitat provides an important travel, resting, and foraging corridor for various species of wildlife, particularly big game, waterfowl, and songbirds (USFS, 1979 and 1994a). The Upper Grande Ronde River sites and the Catherine Creek juvenile acclimation and release site are generally expected to support a greater diversity and abundance of wildlife. These three locations are relatively less disturbed and are surrounded by larger habitat buffers than the remaining proposed sites, which are bordered by cleared pasture and agricultural lands as described below.

Catherine Creek Adult Collection Site and Lostine River Sites

As described in Section 3.3, vegetation at these sites is moderately to highly disturbed, primarily by grazing and other agricultural practices and/or by human access to the river. Riparian vegetation that would be disturbed by project construction is limited and largely previously

disturbed, and/or the sites are surrounded by lands cleared for agriculture. Although riparian habitat is limited, many wildlife species may use these areas for travel, foraging, and cover, including various songbirds, hawks, weasels, bobcats, coyotes, and mule deer. Other species associated with agricultural lands expected to use the vicinity include European starlings and blackbirds. During the January 23 and 24, 1997, site visits the American dipper, mule deer, American crow, and black-billed magpie were observed near these sites.

Catherine Creek Juvenile Acclimation and Release and Upper Grande Ronde River Sites

These three sites provide habitat for a variety of wildlife species associated with riparian and forested mid-elevation habitat of the Blue and Wallowa Mountains, as described by the USFS (1979). Typical wildlife species occurring in the area include various songbirds, grouse, woodpeckers, hawks, bats, porcupines, mink, river otters, raccoons, bobcats, coyote, cougars, black bears, mule deer, and elk. Two osprey nests are located within approximately 1 to 3 kilometers (1 to 2 miles) of one or both of the Upper Grande Ronde River sites. The osprey are likely to forage in meadows near these sites from early May through August (BlumtonBlumpton, 1997). Deer appear to use the access road at the proposed Catherine Creek juvenile acclimation and release facility site as a riparian travel corridor, based on multiple tracks observed during a January 23, 1997, site visit. Probable mink and coyote tracks were also observed during the Catherine Creek site visit.

Endangered and Threatened Species

Two federally and state listed endangered or threatened species of wildlife are known or expected to potentially occur in the vicinity of all of the sites: the federally endangered peregrine falcon and the federally threatened bald eagle (USFWS, 1997). In addition, one federal candidate species (the Columbia spotted frog) and 14 federal wildlife species of concern (including one invertebrate and one state-listed endangered species, the California wolverine) may occur in the vicinity of some or all of the sites (USFWS, 1997) (Table 57).

One wildlife species considered sensitive by the USFS (the Preble's shrew) may also occur at the Upper Grande Ronde River sites. The ONHP (1997) has no records of federal- or state-listed endangered, threatened, or rare species of wildlife occurring on any of the sixseven sites. However, ONHP (1997) records indicate that observations of six such species have been recorded within 3 kilometers (2 miles) of the two Upper Grande Ronde River and the and Catherine Creek sites, as well as the Lostine River adult collection site. The six species are the bald eagle, northern goshawk, the American marten, and three bat species.

The occurrence of the two federally listed species and the one federal candidate species are described below. A Biological Assessment/Biological Evaluation (BA/BE) addressing the two listed species and the one USFS sensitive species of wildlife is being prepared by BPA and will be submitted to USFWS in compliance with Section 7 of the ESA.

Although no federally endangered peregrine falcons have been documented to occur within 3 kilometers (2 miles) of any of the proposed sites, this species may occur in the vicinity of all sixseven sites during spring and fall migrations (USFWS, 1997; ONHP, 1997). Peregrine falcons feed primarily on waterfowl, shorebirds, and songbirds and thus are most likely to occur in areas where these prey species concentrate, such as in estuarine, mudflat, wetland, riparian, and agricultural habitat (Porter and White, 1973; Rodrick and Milner, 1991).

Wintering and/or nesting bald eagles are known to occur in the general region encompassing all sixseven sites, concentrating in areas with dependable food sources (ODFW, 1996). Bald eagles in Oregon feed primarily on fish; carrion; and trapped, crippled, or dying fish, birds, or mammals (ODFW, 1996). Approximately two to three bald eagles are known to winter in the vicinity of the two proposed Upper Grande Ronde River sites (BlumtonBlumpton, 1997). Five forage sightings of bald eagles have been reported within 5 kilometers (3 miles) of the proposed Upper Grande Ronde River juvenile acclimation and release site, and seven sightings have been recorded within 8 kilometers (5 miles) of the proposed Upper Grande Ronde River adult collection site (Rode, 1997). A bald eagle was observed perching in a large conifer on a ridgetop about 0.8 kilometers (0.5 mile) upstream from the proposed Upper Grande Ronde River adult collection site during a January 23, 1997 site visit.

A winter roost site occurs about 3 kilometers (2 miles) from the proposed Catherine Creek juvenile acclimation and release site; two bald eagles were known to use this site in 1990 (ONHP, 1997). A winter night roost occurs about 2.7 kilometers (1.7 miles) from the proposed Lostine River adult collection site; up to seven bald eagles were known to use this site in 1990 (Miller, C., 1997). The closest known winter night roost to the proposed Lostine River juvenile acclimation and release facility is located 1.6 kilometers (1 mile) away; up to nine bald eagles were known to use this roost during the winters of 1988 through 1991 (Miller, C., 1997). No other active bald eagle roost or nest sites are known to occur within 3 kilometers (2 miles) of the six sites (ONHP, 1997). An immature bald eagle was observed flying near the Lostine River juvenile acclimation and release site during a January 24, 1997, site visit.

The Columbia spotted frog, a federal candidate species, breeds in marshy pond or lake edges, algae-covered overflow pools or streams, or slow-moving streams (ODFW, 1996). The ONHP (1997) has no record of observations of this species within 3 kilometers (2 miles) of any of the six proposed sites.

3.4.2 Potential Impacts of Proposed Action Alternative

Potential project effects on wildlife from the Proposed Action Alternative would be: (1) removal and disturbance of wildlife habitat (see Section 3.3); and (2) disturbance and displacement of individuals. Construction and operation of the proposed facilities would remove habitat of potential value to wildlife, primarily at the Upper Grande Ronde River sites and the Catherine Creek juvenile acclimation and release site. Removal of trees and/or shrub habitat at these sites may reduce cover and forage for birds and mammals in a riparian travel corridor. Most disturbance of riparian habitat for the proposed facilities would be short term and minimal in extent relative to the availability of such habitat in these areas (see Section 3.3 and Table 86).

Some potential disturbance or displacement of wildlife, including the nesting and foraging of ospreys near the Upper Grande Ronde River adult collection site, could occur during project construction and operation. Most of these effects would likely be limited to the immediate site vicinity and the seasonal period of on-land and instream construction (June through September/July to October) and operation (on average late February through April to mid-April for the juvenile acclimation and release sites and mid-May through to late September for the adult collection sites).

Existing wildlife use of most sites is likely limited to some extent by current and past levels of human-related activities and disturbance, particularly sites surrounded by areas cleared for agricultural practices. The temporary 2.4-meter (8-foot) tall chain-link fencing built for safety and security reasons to enclose the acclimation and release facilities may displace but would not be expected to block some wildlife movement in a limited area along riparian travel corridors. Juvenile acclimation and release facilities may attract foraging birds and mammals. Implementation of measures to reduce predation on juvenile salmon in the acclimation and release facilities, such as placing netting over the tanks, would deter such effects.

Project activities may affect the availability of fish prey for some wildlife. Removal (as permitted by NMFS) of adult spring chinook salmon from each of the three adult collection sites may reduce the amount of prey potentially available to some wildlife species. Removal of spring chinook salmon parr (up to 500 individuals) from each of the three site streams for use as captive broodstock over a five-year period may also reduce the availability of prey. However, other prey (e.g., steelhead, bull trout, and suckers) would likely continue to be available in these reaches. In addition, wildlife may derive benefits over the long term if the prey base increases as a result of increased future salmon runs attributable to the Proposed Action Alternative.

Cumulative effects on wildlife would be minimal due to the small, localized, and seasonal nature of project construction and operation and/or current levels of existing activities at all six proposed sites.

Endangered and Threatened Species

Project construction and operation are not likely to adversely affect the federally endangered peregrine falcon or the federally threatened bald eagle. Summer activities associated with instream and on-land project construction (June through September/July to October) and temporary collection and monitoring of spring chinook salmon (from about late mid-May through to late-September) may overlap the spring and possibly the fall migration periods of the peregrine falcon, but they would not overlap the bald eagle wintering period (November 1 to March 31). Thus, these activities could potentially disturb or displace foraging migrant peregrine falcons but would not be expected to affect wintering bald eagles.

Operation of the juvenile acclimation and release facilities from about early February through to early mid-April could increase noise and the existing levels of human-related disturbance and activity in the vicinity of the sites (particularly at the Upper Grande Ronde River and Catherine Creek sites). These effects could potentially displace foraging migrant peregrine falcons or wintering bald eagles. However, potential effects of disturbance and displacement are expected to be localized, seasonal, and limited based on the known or expected low levels of use of the project vicinity by these two species.

No peregrine falcon or bald eagle nesting territories or roost sites are known to occur within 1.6 kilometers (1 mile) of any of the sites; thus, no known or potentially suitable active roost or nest trees would be removed by project construction. Although up to three trees with a greater than 53-centimeter (21-inch) dbh would be removed from the site of the Catherine Creek juvenile acclimation and release facility, other alternative or equivalent trees are potentially available for bald eagles at this site. However, this site may not be suitable for bald eagle perching due to the current levels of human-related activity in the area, including the presence of an adjacent USFS road and a trailer residence across the creek. No known peregrine falcon or bald eagle nesting territories or roost sites occur within 2 miles of any of the sites.

Removal of adult and juvenile spring chinook salmon would likely not significantly reduce the availability of prey for bald eagles. This activity would occur outside the bald eagle wintering period as indicated previously. Moreover, adult spring chinook salmon occur in these reaches only from April through September (ODFW et al., 1989). In addition, other fish species are available to bald eagles, as described previously. Over the long term, bald eagles may benefit from the anticipated increase in salmon runs expected to result from the Proposed Action Alternative.

The federal candidate Columbia spotted frog is not likely expected to be affected by the proposed project because potentially suitable habitat (ponds, lakes, slow-moving streams) would not be affected by project construction or operation. The state endangered wolverine and, the 14 federal species of concern (including one invertebrate species and the USFS sensitive Preble's shrew) are not expected to be affected or could potentially be minimally affected by project construction or operation as described previously for wildlife in general in Section 3.4.2 or in the BA/BE. Thus, the project may impact individuals or habitat for such species but will likely not contribute to a trend towards federal listing or cause a loss of viability to such populations or species.

3.4.3 Potential Impacts of No Action Alternative

Under the No Action Alternative, no wildlife resources, including endangered or threatened species, would be affected as a result of construction of the proposed

adult collection and juvenile acclimation and release facilities. The potential for future disturbance of wildlife resources at these sites from other sources appears to be low, based on the existing uses and expected future management at these sites. If Grande Ronde Basin spring chinook salmon became extinct, a potential food source for some wildlife species would be lost.

3.5 Land Use

3.5.1 Existing Environment

The proposed adult collection and juvenile acclimation and release sites on the Upper Grande Ronde River and Catherine Creek are located in Union County; the sites on the Lostine River are located in Wallowa County. The northeastern Oregon region is rural and sparsely settled. The two-county area had an estimated 1995 population of 31,650 (OSU, 1995). The local economy is dependent upon agriculture, timber, and tourism (U.S. Department of Commerce, Bureau of the Census, 1991). Agricultural activities consist primarily of ranching and dryland farming. Timber is harvested from public and private forest lands located primarily in the higher-elevation parts of the region. Lumber mills and related manufacturing are located in several towns. Recreation and tourism draw visitors to the region and support a variety of retail trade and service businesses. Specific land use and related resource conditions at the proposed action sites are summarized below.

Upper Grande Ronde River

Both proposed sites on the Upper Grande Ronde River are within the boundaries of the Wallowa-Whitman National Forest. The adult collection site is near USFS Road 51 on the west bank of the river, near the eight-site USFS River CCampground. A walk-in campsite with a picnic shelter is situated on the east bank at the site, adjacent to USFS Road 51. The juvenile acclimation site is located adjacent to USFS Road 5125 at the upper limits of Vey Meadows in an undeveloped USFS campground.

The lands surrounding both sites are managed to protect local forest resources and provide recreation opportunities for the public under the management designations and standards of the

Whitman-Wallowa National Forest Land and Resources Management Plan (Evans, 1997). Both sites are classified as managed for wildlife, timber production, and winter range. In addition, national forest lands within the interior Pacific Northwest are managed under the PACFISH guidelines (USFS and Bureau of Land Management [BLM], 1994), which the USFS and the BLM developed to protect habitat for the listed Snake River salmon species and other weak fish stocks.

Several other recreation facilities are in the general vicinity of the Upper Grande Ronde River sites. Red Bridge and Hilgard Junction State Parks, located along Oregon Highway 244 over 16 kilometers (10 miles) north of the proposed sites, offer camping, fishing, and picnicking. The USFS Spool Cart Campground is on USFS Road 51, approximately 13 kilometers (8 miles) north of the proposed adult collection site. The former USFS Woodley Campground, which was recently closed and decommissioned to protect salmon, is approximately 1.6 kilometers (1 mile) east of the proposed juvenile acclimation and release site near USFS Road 5125. The proposed site for the juvenile acclimation and release facility is an undeveloped campground that is used primarily by hunters during the fall months. The Woodley Rocks geologic feature is located across USFS Road 5125 just north of this camping area, where a 1.6-kilometer (1-mile) trail leads through a rock formation called the "Hoodoo" to the Woodley Campground site. Numerous USFS roads provide access for a variety of informal outdoor activities in the vicinity of the two sites.

A portion of the Grande Ronde River to the north, or downstream of the proposed sites, has been designated as a federal wild and scenic river (Palmer, 1993). The stretch of river that encompasses the proposed juvenile acclimation and release and adult collection sites has been nominated as a study site for potential wild and scenic listing. In a 1996 draft study report and EA, the USFS recommended this reach of the Grande Ronde River not be designated as wild and scenic. Congress has not made a final decision on this recommendation. However, the USFS is obligated to manage this portion of the river to protect the values that made it eligible for designation—recreation, fisheries, wildlife, and historic resources. In addition, the wild and scenic nomination obligates the USFS to manage the visual resources of this portion of the river as if it were listed. The USFS has assigned a Visual Quality Objective of Retention to this portion of the Upper Grande Ronde River. This designation only allows management activities that are not visually evident.

The juvenile acclimation and release site is forested with small clearings breaking the canopy, and views are enclosed. The forest is primarily mature evergreens, and understory vegetation is relatively limited. The adult collection site is in a meadow surrounded by forested knolls, allowing middleground-distance views to the ridges west of the river and upstream. Human activities are more evident at this site as a result of the paved USFS Road 51, clearing and structures at the campground, and the former USFS guard station at the junction with USFS Road 4305.

Catherine Creek

The proposed adult collection facility would be constructed on the north bank of the creek at the existing fish ladder and the city of Union's water supply diversion structure. Access to the site is off Oregon Highway 203 via an existing dirt road. Surrounding land uses include scattered rural residences, large agricultural fields and pastures, and small patches of forest.

The site for the proposed juvenile acclimation and release facility is adjacent to USFS Road 7785 about 0.8 kilometers (0.5 mile) east of Highway 203 and approximately 3 kilometers (2 miles) upstream (southeast) of Catherine Creek State Park. The proposed site is within a large property owned and operated by Oregon State University (OSU) as an agricultural experiment station. The acclimation and release facility would be situated on the north bank of the narrow, forested river ravine. OSU uses the site for riparian research projects.

Land uses at the two proposed Catherine Creek sites are regulated by Union County. The two sites are designated A-4, Timber-Grazing Zone in the County's Zoning Code (Hartell, 1997; Union County, Oregon, no date). This land use designation allows only one dwelling to be constructed on a legal lot, and minimum parcel sizes exceed 100 acres.

Formal recreation facilities in the vicinity of the proposed sites include Catherine Creek State Park, an ice cave just southeast of the state park, and the North Fork Catherine Creek Campground and the North Fork Picnic Area (both on USFS Road 7785 northeast of the proposed juvenile acclimation and release site about 10 and 11 kilometers [6 and 7 miles], respectively). Some informal recreational use occurs near the latter site where USFS Road 7785 crosses Catherine Creek.

The juvenile acclimation and release site is thickly forested with significant rock outcroppings. The site is in the foothills of the mountains and supports significant deciduous underbrush. Views at this site are enclosed, although a small trailer residence is visible across the creek. The adult collection site is located at the foot of a grassy hillside dotted with tall conifer trees, with some brush along the river's edges. Partially screened views from the site include Highway 203 and a residence a few hundred yards to the southeast.

Lostine River

The proposed adult collection site A is located just upstream of the confluence of the Lostine and Wallowa Rivers near a farm and pasture region adjacent to the recently constructed fish ladder on the Wynan Trout Farm. Adult collection site B, the Miles Ditch site, is at the Route 82 highway crossing of the Lostine River. The proposed juvenile acclimation and release facility would also be located on private property at the downstream end of the Krieger Ranch near an existing irrigation diversion.

The Lostine River sites are subject to Wallowa County land use regulations. The Exclusive Farming Use-Timberlands-Grazing Zone applies to most of the rural, privately owned lands in Wallowa County (Sarbacher, 1997).

The Lostine River area is popular for hiking, camping, horseback riding, and fishing. The Lostine River Road parallels the river past the site of the proposed juvenile acclimation two southerly captive broodstock and release facility nearly to the headwaters of the river. The Lostine River This Road provides access to the Williamson, Shady, and Two Pan USFS Campgrounds and the Pole Bridge and French Camp Picnic Areas, as well as access to trails and other dispersed recreation resources. Oregon Route 82 is intersected by gravel roads that provide direct access within a short distance to the Miles Ditch site. The proposed action sites are not available for public recreation use and do not appear to be used informally.

In the vicinity of the proposed action sites, the Lostine River is emerging from the mountains and passes through a sparsely forested valley. The surrounding ridges to the east and west are visible from the potential sites. Features visible in the foreground include ranch outbuildings and the existing irrigation diversion structures at the proposed juvenile acclimation and release site, the trout farm facilities and a distant nearby farmhouse and buildings at the proposed adult collection site A and the highway crossing and existing diversion structures at adult collection site B. The upper reaches of the Lostine River have been designated as a wild and scenic river; however, the proposed facilities would be located downstream of these protected reaches of the river (Palmer, 1993).

3.5.2 Potential Impacts of Proposed Action Alternative

Various land use regulations are applicable to the sites affected by the Proposed Action Alternative. None of the sites are located in coastal or shoreline management areas. The soils found at each of the sites could be used for agriculture, although the land has not been designated as prime farmland. Each site is partly, if not entirely, located within the 100-year floodplains of the three site streams. Neither the Federal Emergency Management Agency nor the respective county governments, however, regulate floodplain development in the vicinity of the proposed sites. As the rivers support chinook salmon stock, they are designated by the Oregon Division of State Lands as "Essential Habitat Streams" (Lumley, 1997). As such, construction activities would require a Removal and Fill Permit from that state agency as well as a Section 404 Permit from the U.S. Army Corps of Engineers. More specific land use compatibility and regulation aspects are discussed below for each sites.

Upper Grande Ronde River

The proposed adult collection facility would be compatible with the current land use at the site, would not affect adjacent ranching uses, and would be consistent with USFS wildlife management objectives. Located within national forest boundaries, this site is not regulated by county zoning ordinances. Construction activity would probably have minor disturbance effects on users of the River Campground, but these would be limited to one season. Operation of the facility would overlap with most of the recreation season, however, and traffic and activities at the site would likely be noticed by campground users. Noise from portable generators that may be used at the site would probably be the primary effect at the campground. The required clearing for the development at this site would be limited and would not include the removal of existing mature trees, so the scenic qualities of the area would likely be preserved. The completed facilities would likely be viewed by some campers but would not be prominent or out of character with the surroundings.

The raceways at the proposed juvenile acclimation and release site would be located in an existing clearing at an undeveloped campground. This site is also located within national forest boundaries and is not regulated by county zoning ordinances. Limited trees and brush would be cleared. Construction activities could disturb some users of the site during the construction season, although the existing uses would not be displaced on a long-term basis. The proposed juvenile acclimation and release facility would be operated at a time of year when few users are present. The water supply and discharge/fish release piping would be buried and would not be visible. The raceways would be visible at close distances and would change the visual character of the site, but these features would be seen by few viewers. In addition, they would have a relatively low profile because of the patterned or colored sidewalls and the camouflage netting that would be used to prevent bird predation.

Catherine Creek

Development of the proposed adult collection facility on Catherine Creek at the existing diversion and fish ladder would be compatible with surrounding land use. County regulations do not specifically address this type of land use, but would likely permit the development of the site as a conditional use. The proposed realignment of the dirt road, installation of the intake pump station, and extension of the nearby powerline would not noticeably affect the scenic qualities of the site, given the existing degree of modification. In addition, no trees would be removed from the site. The proposed facility would not affect recreational opportunities.

The proposed juvenile acclimation and release facility would be located at the far end of the OSU property in order to minimize potential impacts to ongoing riparian research activities. The site would be graded and cleared to allow installation of the raceways. The proposed development is not identified as a permitted use, but likely would be a conditional use under the Union County Zoning Code (Union County, Oregon, no date). These improvements would not affect surrounding land uses and would not displace recreational opportunities in the area. The intake structure would likely be visible to recreationists in the vicinity of the bridge on USFS Road 7785. The raceways might be visible from the trailer residence located across the creek from the site.

Lostine River

The proposed development of two facilities on the Lostine River would be a permitted land use under the Wallowa County zoning regulations. Whichever site is selected, t The proposed adult collection facility on the Lostine River would be compatible with the existing agricultural use.irrigation diversion uses, and with the trout farm uses at site A. Development of the facilities would not affect recreational activities in the vicinity. Considering the existing evidence of human activities at each site, such as the diversion and fish ladder structures, nearby wood frame buildings and the highway, the proposed facilities would likely not affect the scenic character of the area.

The proposed juvenile acclimation and release site would be consistent with the existing land uses and would not affect recreational activities in the site vicinity. Passersby on the Lostine River Road would likely be able to view down the slope to the facilities, but due to the existing evidence of human activity in the

vicinity, the proposed facilities would not likely affect the scenic values of the area.

3.5.3 Potential Impacts of No Action Alternative

Under the No Action AlternativeNo Action alternative, there would be little or no expected change from existing land uses, recreational activities, or aesthetic qualities. Current property owners, however, would be free to change existing uses and develop these sites to meet future needs consistent with applicable land use policies and regulations.

3.6 Cultural Resources

3.6.1 Existing Environment

The potential for cultural resource finds at the proposed action sites is based on prehistoric and historic use of the study area by Native Americans and on historic uses such as early timber harvest and mining. A BPA contractor conducted a literature search to determine the presence of previously recorded cultural resource sites within the Proposed Action Alternative locations. No cultural resource sites have been recorded at any of the proposed adult collection or juvenile acclimation and release localities. Most of the cultural resources surveys conducted near the proposed project areas have been of forested, mountainous terrain.

In addition to the literature search, intensive archaeological surveys with limited subsurface testing were conducted in 1997 for the juvenile acclimation and release sites because most ground-disturbing activities would occur at these locations. The adult collection locations have already been utilized in the past and would require relatively small ground disturbance (Lyon, 1997a and 1997b; Jaehnig, 1997). The surveys were conducted to determine the on-site potential for cultural or historic resources.

Native Americans used the resources of the Grande Ronde Basin for thousands of years prior to the arrival of pioneer settlers. The fish, wildlife, and plants of the basin provided both subsistence and the basis for spiritual and ceremonial activities and beliefs. For example, the Vey Meadows area (which includes sites of the proposed adult collection and juvenile acclimation and release facilities on the Upper Grande Ronde River) was traditionally used by Native Americans for grazing horses and training young people to fish (USFS, 1994a). The CTUIR and the NPT have reserved treaty rights in the basin to harvest fish at usual and accustomed places and to hunt and gather on open and unclaimed lands that they ceded to the United States in the Treaty of 1855. Salmon are highly valued by tribal members for cultural and economic purposes.

Historical Euro-American uses of the study area generally date from the latter part of the 19th century (USFS, 1994a). Mining, primarily placer mining, occurred at several locations beginning in the 1860s. Early timber harvest activities included the construction of splash dams and primitive railroads dating from approximately 1890. Domestic livestock grazing in the area began at approximately the same time.

The literature surveys resulted in the identification of numerous prehistoric and historic sites in the general vicinity of the sites of the proposed facilities. Surveys for a proposed Catherine Creek dam and reservoir, consisting of about 3.9 square kilometers (1.5 square miles) of valley floor and lower valley wall terrain, resulted in the location of 10 prehistoric sites, 2 of which also have historic components (Cole, 1973). Other surveys performed for small projects and are not as representative of the density or distribution of sites across the landscape.

The cultural resource and ethnographic literature search confirms that cultural sites may be found from ridges to valley floors. Nonetheless, the greatest density of sites will most likely be on valley floors, often in proximity to water. All of the proposed facilities are on valley floors, adjacent to streams, and therefore, all must be considered to have a high potential for the presence of cultural resources. This includes the proposed Catherine Creek adult and juvenile sites, which are within areas that have been surveyed as part of other projects (Cole, 1973; Dobbs, 1971; Galm, 1995). Even though the Catherine Creek sites are within previously surveyed areas and the chances are small that unrecorded sites are present, they are in high site probability, valley bottom portions of the landscape. The discovery of site 35UN242 (Burney et al., 1992) within the previously surveyed Catherine Creek dam and reservoir area (Cole, 1973) demonstrates that sites are sometimes missed, only to be found at a later date.

Previously conducted cultural resources surveys also indicate that the valley floors are neither one continuous cultural site, nor a complex of multiple overlapping cultural sites. There are areas where no evidence of previous human activity exists, and from a cultural resources perspective, this is where proposed construction activities should be conducted.

No sites or materials of archaeological significance were found during the intensive site surveys in 1997 (Lyons, 1997a and 1997b; Jaehnig, 1997) of the proposed Upper Grande Ronde River, Catherine Creek, and Lostine River juvenile acclimation and release sites. However two tertiary, basalt, bifacial flakes were found at the Upper Grande Ronde River juvenile salmon acclimation and release site, and one was found at the proposed Catherine Creek juvenile acclimation and release site.

3.6.2 Potential Impacts of Proposed Action Alternative

Based on the findings of the intensive field studies in 1997, the Proposed Action Alternative would not likely affect any cultural or historic sites. During construction, however, if sites are found during ground-disturbing activities, efforts will be stopped in the affected area, and the State Historic Preservation Office and tribal representatives will be notified. If impacts to a cultural site cannot be avoided, BPA would consult with the State Historic Preservation Office and tribes and prepare an historic property management plan for the site.

3.6.3 Potential Impacts of No Action Alternative

Under the No Action Alternative, construction of the proposed adult collection and juvenile acclimation and release facilities would not occur and would not create the potential for disturbance of or damage to cultural materials. Undiscovered cultural resources at the six proposed action sites would continue to be subject to discovery and/or disturbance as a result of ongoing or future uses of the sites by their respective managers or owners.

3.7 Air Quality

3.7.1 Existing Environment

Air quality in the Columbia River Basin, including the northeastern Oregon study area of the Proposed Action Alternative facilities, generally meets existing ambient air quality standards (BPA, Bureau of Reclamation, and Corps of Engineers, 1995). Nevertheless, some areas of the basin are considered "nonattainment areas" because they do not comply with one or more air quality standards.

The ODEQ has designated the city of La Grande as a nonattainment area for particulate matter, specifically small particulate matter less than 10 microns in diameter (PM10) and smoke, and has established a special protection zone with a 32-kilometer (20-mile) radius surrounding the city (USFS, 1994a). Woodstove smoke is the primary pollutant source of concern, although slash burning has also been identified as a source of PM10 within La Grande.

A voluntary smoke management program has recently been successful in maintaining air quality within the standards. The specific sites that would be affected by the proposed action, four of which may be within the La Grande special protection zone, currently support low-intensity uses that produce minimal levels of air emissions.

3.7.2 Potential Impacts of the Proposed Action Alternative

Construction of the proposed adult collection and juvenile acclimation and release facilities would result in minor, temporary emissions of particulate matter in the form of dust from construction disturbance and (possibly) smoke from burning of any vegetation cleared at the sites. In addition, equipment operating at the site would produce hydrocarbon emissions. Based on the limited extent of clearing at any of the sites, the small-scale nature of the construction activities, and the short duration of the construction period, the Proposed Action Alternative is expected to have no effect or a negligible effect on air quality within the La Grande nonattainment area.

3.7.3 Potential Impacts of No Action Alternative

Under the No Action Alternative, there would be no minor, temporary emissions of particulate matter and hydrocarbons resulting from construction of the proposed facilities. Air quality conditions would continue to be affected by ongoing or planned uses at the project sites, which currently are inconsequential sources of air emissions.

3.8 Cumulative Effects

The NEPA and Council on Environmental Quality (CEQ) implementing regulations require federal agencies to consider the cumulative impacts of their actions. Cumulative impacts are defined as the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what other agency or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (Code of Federal Regulations [CFR] 1506.7).

The Proposed Action Alternative, together with other actions involving supplementation, rebuilding, and/or mitigation would contribute to the efforts by the NPPC, BPA, state and other federal agencies, and Indian tribes to protect and mitigate salmon and steelhead runs in the Columbia River Basin. The cumulative impacts of the program, in conjunction with all of the salmonid rehabilitation and mitigation efforts in the Columbia River Basin including the NPPC's Columbia River Basin Fish and Wildlife Program, are addressed in this section.

Cumulative effects are also being addressed in part by the Impacts of Artificial Salmon and Steelhead Production Strategies in the Columbia River Basin Programmatic EIS (Columbia Basin Fish and Wildlife Authority, 1996) issued as a draft by the USFWS, NMFS, and BPA in December 1996. This Programmatic EIS addresses the cumulative impacts of salmon and steelhead hatcheries and supplementation projects in the Columbia River Basin on naturally-spawning stocks. BPA believes that the Proposed Action Alternative, captive broodstock project can and should move forward ahead of the Programmatic EIS because it meets the following criteria in 40 C.F.R. § 1506.1 (c):

- There is general agreement among the federal, state, and tribal fisheries managers that the steps being taken by the program to address impacts on naturally-spawning stocks need to be implemented as soon as possible in order to prevent further impacts to naturally-spawning stocks. The program would be designed to be consistent with and be evaluated along with all other artificial propagation and supplementation facilities being addressed in the comprehensive analysis.
- The cumulative impacts of the program on Columbia River Basin fisheries are addressed by this Preliminary EA.
- The program would not prejudice the ultimate decision on the Programmatic EIS because it is a flexible, relatively low-cost, small-scale program that could easily be adapted to conform with the ultimate programmatic decisions.

While this Preliminary EA specifically addresses the impacts of the program, it includes the following cumulative impact analysis that considers the impacts of this program on the overall Columbia River Basin fishery. The cumulative impact issues that have been raised regarding artificial production of fish in the Columbia River Basin include the following:

- the impacts of large numbers of hatchery fish on naturally-spawned fish in the Columbia River migration corridor, the estuary, and the ocean;
- genetic fitness impacts on existing natural fish populations;
- the relationship between production and habitat; and
- harvest impacts on natural fish populations.

3.8.1 Migration Corridor Impacts

The proposed program would release up to approximately 600,000 spring chinook salmon smolts annually. This is an extremely small percentage (0.3 percent) of the 197.4 million smolt limit for release in the Columbia River Basin. Predation on ESA-listed smolts is unlikely, for the reasons discussed in Section 3.2.2. Consequently, only minor effects are anticipated on species of salmon listed under the ESA or in the migration corridor, estuary, or ocean, from the release of smolts under this program.

Future increases in the numbers of adults in the migration corridor are anticipated to result from the program. These increases are anticipated to result in only minor effects because, even with the increases expected over the long term, the Grande Ronde Basin would contribute only a small percentage of fish to the overall returning runs. The adults generally do not feed after they leave the ocean, so food **carrying capacity** and predation would not be an issue. Overall carrying capacity in the Columbia River for returning adults would not be a concern given the small number of adult fish in the runs compared to historical numbers. The incidence of adults from the Grande Ronde Basin straying into other basins is expected to decrease due to acclimation of the smolts and

development of locally-adapted stocks. Juveniles that result from these might compete with bull trout or steelhead. They may also be prey for bull trout.

3.8.2 Genetic Fitness

If successful, the program captive broodstock project would help maintain long-term genetic fitness for Columbia River salmonid resources. The program would track genetically-distinct populations through marking. The program would help to rebuild weak stocks, reducing the threat of extinction, and would sustain the diversity of stocks in the basin by enhancing locally-adapted stocks that could become extinct. It is expected that the cumulative effect of a successful program, taken together with other ongoing and future projects in the Columbia River Basin, would be to further protect and maintain within- and among-stock genetic fitness.

If the program were unsuccessful, however, it would add nothing to the genetic fitness of Columbia River salmonid resources. Furthermore, if unforeseen adverse genetic impacts were realized and not contained and if program operations were continued, the net result would be increased erosion of genetic fitness and greater probability of extinction of affected stocks. To prevent this, an adaptive management process for the project has been developed through ongoing monitoring, evaluation, and feedback. In addition, the long-term management plan (see Section 2.1.3) that addresses these issues will be developed before program implementation begins.

Straying of Grande Ronde Basin fish into other basins and dilution of their gene pools by these fish could occur. However, this is not expected to be a problem because fish utilized for the Proposed Action Alternative would be marked differently from other stocks and could be captured and removed from streams where they may have strayed.

3.8.3 Relationship Between Production and Habitat

In Section 7 of the 1994 version of the Columbia River Basin Fish and Wildlife Program, the NPPC reiterated its determination that implementation of production and habitat actions be fully coordinated (NPPC, 1994). The program, if successful, would integrate hatchery and natural production and increase stock abundance, productivity, and use of available habitat. However, results would be amplified when coupled with the ongoing and proposed habitat improvement actions in the basin.

The cumulative effect of the Proposed Action Alternative captive broodstock project with habitat improvement projects in the Grande Ronde Basin would be to increase the chances for recovery of salmonid resources in the basin. On a regional basis, successful supplementation and other artificial production projects, together with habitat and passage improvements, would help to achieve the full natural and hatchery production potential of the Grande Ronde Basin and the Columbia River Basin in general. The cumulative effect would be to amplify the basin-wide shift toward optimum habitat utilization and to reduce reliance on traditional hatchery production.

If the program were unsuccessful and natural production increases were not realized, then the rate of stock rebuilding in the Grande Ronde Basin would remain at levels consistent with those of ongoing habitat improvement efforts and other external management actions. (This may include extinction of these populations.) Releases of artificially-produced fish during the program would still increase the potential for adverse ecological interactions and disease transfer to naturally-reproducing fish in the Grande Ronde River, Snake River, and Columbia River Basins. The project's hatchery operational procedures and monitoring and evaluation program will be designed to identify and contain these risks.

3.8.4 Harvest

The cumulative impacts of the Proposed Action Alternative and other propagation projects outside the Grande Ronde Basin may be adverse for some unsupplemented naturally-produced stocks. If the program and other propagation efforts were successful, the relative proportion of fish from artificial production facilities in aggregate runs returning to the Columbia Basin would increase, and the runs could provide more harvestable fish.

Under the Columbia River Fish Management Plan (CRFMP), catch ceilings in Columbia River fisheries are adjusted in response to observed total run sizes. If program efforts produce more fish and thus expanded harvest opportunities (including catch and release), harvest pressure on unsupplemented natural stocks in mixed-stock fisheries might proportionally increase. Increased harvest pressure triggered by larger aggregate run sizes might incidentally result in overharvest of less productive stocks within stock mixtures (Walters, 1988). However, Columbia River harvest managers, using the flexibility provided by the CRFMP, have been able to reduce impacts significantly on endangered Snake River chinook salmon stocks by reducing overall harvest rates in the mixed stock fishery. This flexibility has allowed harvest of abundant stocks while affording protection to the weaker stocks.

Depending on several factors, the increased numbers of returning spring chinook salmon annually to the aggregate upper Columbia River and Snake River have the potential to alter current harvest regimes. Contributions of adult fish from other proposed propagation actions currently are unknown. Consequently, it is impossible to project the cumulative impacts of the program with other similar proposed actions on Columbia River runs and fisheries.

Conceivably, the program and other similar regional projects could also result in positive cumulative benefits for some weaker stocks. Mixed-stock fisheries can be managed so as to protect such stocks. When stock-specific differences in run timing, geographic distribution, or other characteristics are known to exist, fisheries can be structured by regulatory measures (collectively termed "time-area-gear restrictions") to increase harvest pressure selectively on stronger stocks and to reduce pressure on weaker stocks. Controlled harvest rates have also been successful in protecting weaker Columbia River stocks. Such measures currently are applied to commercial and sport fisheries. Cumulatively, successful artificial production might lower the harvest rate on weak stocks due to a proportional dilution of weak stocks in the aggregate stock mixture.

If the program were unsuccessful, and increases in harvest benefits were not realized, harvest restrictions may remain the same or could become more strict.

SECTION 4: AGENCIES AND ORGANIZATIONS CONSULTED

Confederated Tribes of the Umatilla Indian Reservation

National Marine Fisheries Service
Natural Resource Conservation Service
Nez Perce Tribe
Oregon Department of Fish and Wildlife
Oregon Division of State Lands
Oregon Natural Heritage Program
Oregon State Historic Preservation Office
Oregon State University
Union (City of), Oregon
Union County, Oregon
U.S. Fish and Wildlife Service
U.S. Forest Service
Wallowa County, Oregon

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SECTION 6: GLOSSARY, ACRONYMS, AND ABBREVIATIONS

Glossary

acclimation The process of rearing and imprinting juvenile fish in the water of a particular stream before fish are released into that stream.

anadromous Fish that hatch in fresh water, migrate to salt water to mature, and then return to spawn in fresh water.

best management practices A practice or combination of practices that are the most effective and practicable, including technological, economic, and institutional considerations. In reference to preventing or reducing non-point sources of pollution to a level compatible with water quality, an example is the use of hay bales or other structures or re-seeding to prevent or minimize erosion or sediment runoff during construction.

captive broodstock Salmon or other fish reared in captivity until maturation for at least a complete life cycle (e.g., parr to adult).

carrying capacity The maximum population density that can be sustained under a given set of conditions.

competition The direct or indirect interaction among organisms of the same or different species that use a common resource.

endemic Refers to a group of fish (e.g., spring chinook salmon) that are native or return to a specific area (e.g., Grande Ronde Basin).

entrainment A process whereby fish or other organisms are diverted or drawn into a water intake.

escapement The number of fish that return where they were spawned.

fish habitat The aquatic environment and the immediately surrounding terrestrial environment that, in combination, afford the necessary biological and physical requirements for fish species at various life stages.

fry The life stage of a fish from hatching of the egg through absorption of the yolk sac to a size of one inch in length.

genetic Relating to the study of heredity and variation in organisms of the same or related kinds.

hatchery produced fish A fish incubated or reared under artificial conditions for at least a portion of its life cycle.

impingement The process of a fish or other organism being pinned against a water intake screen.

imprinting Ability of juvenile fish to determine its "natal" stream (i.e., stream of origin).

juvenile The early stage in the life cycle of anadromous fish; it is usually considered to be the stage between the fry and smolt stages.

mitigate To lessen the impact of activities or events that cause a loss of species or species' habitat.

natural production See naturally-produced fish.

naturally-produced A fish produced by spawning and rearing in natural habitat regardless of the parentage of the spawners.

parr Juvenile stage of salmon or trout prior to the ocean-bound smolt stage. This stage typically occurs in the summer or fall prior to the following spring smolt stage.

palustrine-emergent wetlands Non-tidal wetlands characterized by erect, rooted, herbaceous water-dependent plants, excluding mosses and lichens.

population A group of fish belonging to the same species that occupy a defined locality, do not interbreed to any significant degree with any other group of fish, and have separate life histories.

predation The consumption of one organism by another.

raceway A pond (usually rectangular and with linear water flow) for rearing juvenile fish or holding adult fish.

rearing Growth in freshwater of anadromous fish before they migrate to the ocean.

recovery escapement level The number of returning adults needed to produce a self-sustaining and self-regulating population.

redd The area of a streambed where adult salmon or trout deposit eggs.

riparian A term pertaining to features or land use along the banks of a stream.

resident fish A non-migratory fish species that complete its entire life cycle in freshwater.

run A population of fish of the same species consisting of one or more stocks migrating at a discrete time.

salmonid A fish of the Salmonidae family, which includes salmon and trout.

smolt A juvenile anadromous salmonid fish capable of migrating toward salt water.

smoltification Process whereby the parr matures into a smolt.

species One or more stocks whose members interbreed under natural conditions and produce fertile offspring.

straying The return of a fish to a location other than its natal stream or place of release.

supplementation Increasing natural production by taking fish into a protected artificial environment for all or a portion of their life cycle and then releasing them, or their progeny, into streams where they are later expected to reproduce naturally.

threshold escapement level The number of returning and spawning adults needed for survival of the species.

trashrack A frame placed in a stream to collect debris and minimize its entry into the trap.

turbidity The relative clarity of water.

volitional release A juvenile fish release strategy that allows fish to voluntarily leave a pond without being pumped or forced to leave.

weir A fence or enclosure set in a waterway for capturing fish or blocking their migration.

Acronyms and Abbreviations

BA/BE Biological Assessment/Biological Evaluation

BGD bacterial gill disease

BKD bacterial kidney disease

BLM Bureau of Land Management

BPA Bonneville Power Administration

CEQ Council on Environmental Quality

CFR Code of Federal Regulations

cfs cubic feet per second

CRFMP Columbia River Fish Management Plan

CTUIR Confederated Tribes of the Umatilla Indian Reservation

CWD cold water disease

dbh diameter at breast height

DOE see USDOE

EA Environmental Assessment

EIBS erythrocytic inclusion body syndrome

EIS Environmental Impact Statement

ERM enteric redmouth disease

ESA Endangered Species Act of 1973

FONSI Finding of No Significant Impact

fps feet per second

gpm gallons per minute

IHN infectious hematopoietic necrosis

l/m liters per minute

m³/s cubic meters per second

NEPA National Environmental Policy Act

NHPA National Historic Preservation Act

NMFS National Marine Fisheries Service

NPDES National Pollutant Discharge Elimination System

NPPC Northwest Power Planning Council

NPT Nez Perce Tribe

ODEQ Oregon Department of Environmental Quality

ODFW Oregon Department of Fish and Wildlife

ODWR Oregon Department of Water Resources

ONHP Oregon Natural Heritage Program

OSU Oregon State University

PM₁₀ particulate matter of < 10 (microns in diameter)

SHPO State Historic Preservation Officer

USDOE U.S. Department of Energy

USFS U.S. Forest Service

USFWS U.S. Fish and Wildlife Service

WDFW Washington Department of Fisheries and Wildlife

Appendix A

Environmental Consultation, Review, and Permit Requirements

1.0 National Environmental Policy Act

This environmental assessment has been prepared pursuant to the NEPA (42 USC 4321 *et seq.*) and implementing regulations that require federal agencies to assess the impacts that their proposed actions may have on the environment. Under NEPA, BPA has the option to prepare an environmental assessment to provide evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI).

2.0 Wildlife and Habitat

Endangered Species

The ESA of 1973, as amended, requires federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitat. Because the action is targeted for an endangered species, ESA Section 10 permits are required. The lead agency for the overall action, ODFW, has they have requested and received a Section 10 permit for the collection and rearing of the broodstock (August 14, 1996). This permit was modified on June 20, 1997, to include the collection of adult spring chinook salmon in the three site streams. The authorization for ESA-listed fish releases from the supplementation program will require a request for a modification to the existing permit (Diaz-Soltero, 1997).

Section 7(a)(1) of the ESA provides standing authorization under which "all Federal agencies shall, in consultation with the Secretary (of Interior) utilize their authorities in furtherance of the purposes of this Act to carry out programs for the conservation of endangered species and threatened species list pursuant to sSection 4 of the Act." Programs for conservation are defined in the Act as all methods and procedures needed for the recovery and delistings of a species. BPA will complete the necessary consultations with USFWS and NMFS prior to initiating the actions addressed in this EA.

Fish and Wildlife Conservation

Provisions of the Pacific Northwest Electric Power Planning and Conservation Act (6 USC 839 *et seq.*) are intended to protect, mitigate, and enhance fish and wildlife of the Columbia River and its tributaries. This program is proposed as a part of the Columbia River Basin Fish and Wildlife Program to fulfill these obligations.

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 *et seq.*) encourages federal agencies to conserve and to promote conservation of nongame fish and wildlife species and their habitats. The analysis in Section 3 indicates that the proposed action would not significantly affect nongame fish or wildlife.

The proposed action would temporarily divert or direct water from the Upper Grande Ronde River, Catherine Creek, and the Lostine River for the acclimation of juvenile spring chinook salmon and collection of adult spring chinook salmon. No water would be lost to the system and the length of diversion (from withdrawal to return) is less than 91 meters (100 yards) in all cases. The only stream shoreline modification would be locations less than 3.3 meters (10 feet) in length for intake and discharge of water for each facility. Additionally, adult collection facilities would utilize picket weirs that span the width of each stream. These weirs would not likely result in adverse effects on fish or wildlife resources (see Section 3 of the main text).

3.0 Heritage Preservation/Native Americans

The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 *et seq.*) and Executive Order 11593 require federal agencies to take into account the effects of their undertakings on historic properties. A BPA contractor has conducted a literature and file review to determine the extent of previous historical and archaeological surveys, and the existence of any recorded cultural sites, in the vicinity of the six proposed action sites (see Section 3.6.1). This review indicated that no cultural resource sites have been recorded at any of the six proposed locations, but that all of the locations are valley floor sites with a relatively high potential for the presence of cultural resources. BPA also sponsored on-site cultural resource surveys in 1997 for the juvenile acclimation and release sites, because most ground-disturbing activities would occur at these locations (Lyons, 1997a and 1997b; Jaehnig, 1997). No significant resources were found, which resulted in a conclusion that the Proposed Action Alternative would likely have no effect on cultural resources at these locations. However, if cultural materials are uncovered during construction at either the adult collection facilities or the juvenile acclimation and release facilities, work in the immediate vicinity of the find would be stopped, and BPA would consult with the Oregon State Historic Preservation Officer (SHPO) and the Native American Tribes with interests in the study area.

The CTUIR and the NPT both have reserved treaty rights in the areas affected by the proposed action. Both tribes are among the sponsors for the program and have been involved in the development of project plans. BPA has consulted with both tribes concerning cultural resource interests and use rights relative to the proposed action.

4.0 State, Areawide, and Local Plan and Program Consistency

The Proposed Captive broodstock project Action Alternative is generally consistent with applicable land use plans and programs. The required consistency between Oregon local government plans and zoning codes ensures that land use regulation policy and implementation are in agreement. Both the Union County and Wallowa County zoning codes allow the construction of the proposed facilities as either a permitted or conditional use.

5.0 Shorelands and Coastal Management

None of the proposed project sites evaluated in this Preliminary EA are located within coastal zones.

The sites are located on the shorelands of rivers, and the facilities would require instream construction. Each of the affected streams provides habitat for an endangered salmon species. The Oregon Division of State Lands designates such rivers as "Essential Habitat Streams" or "E-Streams." As such, development within the confining banks (defined as the extent of a 5- to 10-year flood event) of these rivers requires regulatory review by the Oregon Division of State Lands and other state agencies, federal and local agencies, and tribes. Regulatory review will occur prior to any instream work.

6.0 Floodplains and Wetlands

Executive Order 11988 was established requiring all federal agencies to avoid adversely impacting floodplains wherever possible. The BPA accommodates the requirements of Executive Order 11988 through USDOE NEPA procedures. In accordance with the USDOE's regulations on Compliance with Floodplains/Wetlands Environmental Review Requirements (10 CFR 1022.12), BPA has prepared the following assessment of the impacts of the Proposed Action Alternative on floodplains and wetlands.

Project Description: The construction and operation of proposed project facilities are described in Sections 1 and 2 of the main text of this Preliminary EA. The proposed facilities are primarily located in the 100-year floodplains associated with the Upper Grande Ronde River, the Lostine River, and Catherine Creek. (Portions of access roads and utilities may be located outside the floodplain.)

Floodplain/Wetlands Effects: To minimize the effect of the floodplain capacity, intake and discharge/outtake pipes, as well as the holding ponds and raceways, would be installed at or below ground level. Grading on site would be required on only a few of the sites and would be minimal. The placement of a temporary trailer on site, however, could affect the holding capacity of the floodplain, depending on the foundation design. The size of the temporary trailer is small, so effects would most likely be considered insignificant considering the surrounding topography at each of the sites and the lack of dwellings or structures that would be affected by flooding. Other facility structures, such as concrete abutments for weirs, would cause a localized impedance to flow but would likely not result in any compounding of flooding in the adjacent floodplain.

Activities in wetlands are regulated under the Clean Water Act. Site investigations (see Section 3.3) were conducted to identify and map wetlands that may be present on the proposed sites. Figures A-1, A-2, and A-3 present the locations of those found. No wetland areas were identified on the three other sites. Due to the very small size of the wetlands and the ability to avoid or minimize effects on these wetlands, only minor potential loss or disturbance is anticipated. Construction work required to build the proposed adult collection and juvenile acclimation facilities would affect wetlands regulated by the U.S. Army Corps of Engineers. Prior to the start of any construction activities, a Section 404 Permit would be required.

Alternatives: By the nature of the proposed facilities, there are no alternatives to location within floodplains that need to be acquired.

7.0 Farmlands

Under the proposed actions, no existing farmlands would be removed from farming production. Underlying soils, the Veazie-Coats Complex, support agricultural production. These soils, however, are generally limited to the floodplain along the three rivers. The soils have not been identified by the Natural Resource Conservation Service (1985) as prime agricultural soils. In addition, the local county land use regulations have not designated any of the sites to protect prime agricultural lands. Having considered these effects and alternatives, provisions of the Farmland Protection Policy Act (7 U.S.C. 4201, et seq.) are satisfied.

Figure A-1. Wetlands Mapped at the Site of the Proposed Grande Ronde River Adult Collection Facility

Figure A-2. Wetlands Mapped at the Site of the Proposed Lostine River Juvenile Acclimation and Release Facility

Figure A-3. Wetlands Mapped at the Site of the Proposed Catherine Creek Juvenile Acclimation and Release Facility

8.0 Global Warming

The proposed program would not create conditions that would increase the potential for global warming.

9.0 Water Resources Protection

All of the proposed sites would involve construction activities on the banks and within the channels of the three target streams. Under these circumstances, issues pertaining to water rights, temporary and long-term water quality, discharge of fill, and the protection of fisheries are regulated and require the review of various federal and state agencies. As much a large portion of the authority to implement the federal regulations has been delegated to the state agencies., tThe Oregon Division of State Lands and the ODEQ are key government agencies responsible for the protection of water resources. The specific permit application that initiates this comprehensive regulatory review is the Oregon Division of State Lands "Removal and Fill Permit," which is required for any cut or fill of greater than 38.2

cubic meters (50 cubic yards) in volume.

Operation of the proposed facilities may require a water right from the ODWR to permit the withdrawal of the water supply for the proposed juvenile acclimation and release facilities. If required, BPA would investigate whether a water right exemption would be applicable to the proposed project.

All necessary permits will be obtained by BPA or the other program co-sponsors (ODFW, CTUIR, or NPT) prior to the initiation of construction.

10.0 Public Lands

Two of the proposed sites evaluated in this EA are located on federal lands. These sites are the adult collection and juvenile acclimation and release sites on the Upper Grande Ronde River, which are located on lands within the Wallowa-Whitman National Forest and administered by the USFS. The development of these sites would require acquisition of a USFS Special Use Permit. Information or investigations required for such a permit include documentation of endangered species consultation; on-site cultural resource surveys; a biological evaluation addressing threatened, endangered and sensitive species; specific information on tree clearing; and, possibly, identification of visual mitigation. One site, the proposed Catherine Creek juvenile acclimation and release site, is on state land administered by OSU. Use rights for this site would be obtained from OSU.

11.0 Energy Conservation at Federal Facilities

The proposed action addressed in this Preliminary EA would not involve the construction, operation, or maintenance of federal buildings. Energy conservation practices are not relevant to the proposed use of federal funding because the proposed action involves minor new structures or modifications to existing structures and minor intermittent consumption of energy resources.

12.0 Pollution Control

The proposed action would be unlikely to involve the discharge of pollutants that could reach public drinking water supplies, the generation of toxic or hazardous waste, the use of pesticides, or the production of unusual or excessive noise emissions. Therefore, the proposed action would be in compliance with the Safe Drinking Water Act; Resource Conservation and Recovery Act; Toxic Substances Control Act; Noise Control Act; and the Federal Insecticide, Fungicide, and Rodenticide Act. Use of portable electricity generators at several of the sites would likely require the preparation of hazardous material spill plans to address fuel handling.

Four of the proposed action sites could be within the special protection zone established for the La Grande, Oregon air quality nonattainment area. The proposed action would result in negligible air emissions that would not affect compliance with air quality standards, however, and would, therefore, be in compliance with the Clean Air Act.

Construction of the proposed Upper Grande Ronde River adult collection facility may result in the discharge of fill material below the line of ordinary high water. Therefore, a 404(b)(1) permit for instream construction would need to be obtained from the Oregon Division of State Lands. BPA or the other program co-managers would undertake the permit process. Effluent discharged from the fish tanks would not exceed the threshold (9,000 kilograms or 20,000 pounds fish per year) listed in 40 CFR 122.24, so an NPDES permit under Section 402 would not be required. The project activities would have minimal impact on water quality and would not violate state water quality standards.

13.0 Constitutional Takings

The proposed action would not involve the government taking of private property without compensation. Three of the six action sites are on public lands, access to which would be secured through special use permits or similar means. The remaining sites are on privately owned lands, for which BPA would acquire use rights from the landowners on a willing-seller basis by paying fair market value for these rights.

14.0 Environmental Justice

The proposed action would not adversely affect minority or disadvantaged groups; no adverse effects on any human groups or individuals are expected.